

THE AMERICAN JOURNAL OF PHARMACY.

SEPTEMBER, 1890.

ON JALAP.

By J. PAUL SUESS, Ph.G.

The literature of jalap, of late years, has been tending towards the fact that the drug is deteriorating in the richness of its active constituent, resin. The writer's attention was forcibly called to this fact by a reprint, in the *Pharmaceutical Record*, of an article on "Compound Cathartic Pills, U. S. P.," by Prof. W. M. Searby, in which he proposes a formula for the pills in which resin of jalap is substituted for abstract. He says: "The substitution of resin of jalap, which I have used in the place of the abstract, is open to criticism. It is well known that the jalap which has come to market of late years has not contained nearly so much resin as we were accustomed to find in the drug 15 or 20 years ago. At the present time, the jalap of the market will not yield on the average more than about 9 per cent. of resin."

When we take into consideration the continued use of the drug, both in pills and powder, and the part it may be called upon to play in the treatment of disease, as employed especially by older practitioners, and the fact that the amount of resin contained in the drug, as variously stated in the books, is from "not less than 12" to 22 per cent., the assertion of Prof. Searby at once becomes of considerable moment to both the medical and pharmaceutical professions, especially at a time when our Pharmacopœia is undergoing revision.

With these facts in view, the writer obtained selected samples of the root from several reliable drug houses throughout the United States

—namely, from Philadelphia, 2; New York, 1; St. Louis, 1; San Francisco, 1; Peoria, 1. They were numbered, respectively, Nos. 1, 2, 3, 4, 5 and 6. Samples 1 and 5 were obtained in Philadelphia. The price varied from 22 cents to 80 cents per pound. The Chicago house of which inquiry had also been made for a sample of whole root did not respond, but advised the obtaining of samples from firms making the powdering of drugs a specialty; this suggested the getting of two samples in a powdered state.

REMARKS.—*No. 1.*—Root; rather small, of grayish color, horny texture, not very heavy—some pieces mealy.

No. 2.—Root; somewhat larger, rounded, dark-colored and resinous—a few pieces mealy.

No. 3.—Root; of good size, dark, resinous, with some tubers hollow.

No. 4.—Root; very fine specimens, large, some $4\frac{3}{4}$ inches long; generally thick and solid, dark-colored, heavy and resinous.

None of above samples were worm-eaten.

No. 5.—Powd. Root; of usual gray color and of weak odor of jalap.

No. 6.—Powd. Root; of somewhat darker gray color, with decided odor of the drug.

Manipulations.—The process of manipulation was the same as that contemplated by the revisers of our last Pharmacopœia. In each case 3,500 grains of the powdered drug was employed, excepting in the case of No. 4, where only 3,000 grs. were used. The root was first rasped, dried and then reduced to a fine powder; moistened with alcohol, sp. gr. 0.820 (60° F.), packed firmly in a long, narrow, cylindrical glass percolator. Enough alcohol was added to saturate the powder and leave a stratum above it, the lower orifice was closed, and the powder macerated for 3 days. Percolation was then continued until the powder was completely exhausted, and the last drops of liquid that passed were devoid of color, taste and odor of the drug, and produced no cloudiness when dropped into water. The alcoholic tincture thus obtained was evaporated to about 3 fl. oz. and precipitated with 4 pints of water, previously reduced to a temperature of about 50° F. After decanting the clear liquid from the precipitated resin, and repeated washings, the resin was carefully dried, weighed and separately preserved.

Ether-soluble Resin.—At the suggestion of Prof. Maisch the per

cent. of ether soluble resin was determined. For this purpose 50 grains of each specimen of resin were digested in 2 fl. oz. of stronger ether, sp. gr. 0.725 (60° F.), for one month with almost daily agitation; the clear ethereal solution poured off and preserved in an accurately tared glass capsule. The operation was repeated twice more and the whole carefully evaporated, when the amount of ether-soluble resin was readily determinable.

Quantitative Results of Proximate Analysis.

No.	Form Employed.	Cost per Lb.	Amount used.	Per Cent. Resin.	Per Cent. Ether-soluble Resin.
		<i>cts.</i>	<i>grs.</i>		
1	Whole Root.	38	3500	7.285	14.0
2	" "	22	3500	9.285	10.0
3	" "	80	3500	11.000	9.0
4	" "	60	3000	14.500	8.0
5	Powd. Root.	40	3500	7.714	12.5
6	" "	50	3500	11.771	11.0
Average,				10.269	10.75

It was noticed that the ethereal solutions of Nos. 2 and 5 were considerably deeper in color than any of the rest; and the deposit of ether-soluble resin, after evaporation, of Nos. 2, 3, 5 and 6, much darker in color than Nos. 1 and 4. Also, that No. 4, which was richest in the amount of resin, yielded the smallest quantity of ether-soluble resin.

From the foregoing analysis the writer is inclined to fully justify Prof. Searby's assertion, and feels admonished that the time has arrived when the revisers of the present Pharmacopœia should suggest the substitution of resin of jalap in place of the abstract in the formula for Pil. Carthartic. Comp., and make the pharmacopœial requirement of the root about 8 per cent. of resin.

WILLIAMSPORT, PA., August 5, 1890.

EXTRACTUM JALAPÆ ALCOHOLICUM.

By JOHN ELMER WISHART, Ph.G.

Abstract from an Inaugural Essay.

Two samples of jalap root were procured, and after being reduced to No. 60 powder, four troy ounces of each were used for preparing the extract by percolation with 95 per cent. alcohol. The percolates

were evaporated to the consistency of soft extracts over a water-bath, dried at 105° C., weighed, and then exhausted with distilled water at 15.5° C. The watery extract was evaporated, dried and weighed. The remaining resin was then treated with stronger ether and the quantity of the ether-soluble portion determined by evaporation and weighing. The results were as follows:

Sample.	Alcoholic Extract.		Resin Per Cent.	Ether-Soluble Resin.
	Total.	Water-Soluble Portion.		
1	14.583 per cent.	2.816 per cent.	11.666 per cent.	12.765 per cent.
2	15.625 per cent.	4.239 per cent.	10.386 per cent.	9.523 per cent.

The resin was reddish-brown in color, No. 2 being of a darker shade; it had an acrid taste and a neutral reaction. One part of it dissolved in 50 parts of water of ammonia yielded a solution which did not gelatinize on cooling; on the addition of hydrochloric acid in excess a precipitate was produced.

Jalapurgin, the resin remaining undissolved by the ether, was brittle, reddish-brown, of a sweetish, afterward acrid taste, and of neutral reaction. It was soluble in alcohol, chloroform and in potassium hydrate solution, the latter solution having a peculiar odor.

The ether-soluble resin was reddish-brown, soft, did not harden on standing, and was soluble in alcohol and potassium hydrate, the latter solution yielding a precipitate on being acidulated with hydrochloric acid.

Resin of jalap was also prepared by the pharmacopœial process by exhausting the powders with alcohol, concentrating the percolate to a small bulk, precipitating with water, washing the precipitate and drying at 105° C. The amount of resin thus obtained was 9.79 per cent. from sample No. 1, and 8.75 per cent. from sample No. 2. The smaller yield by this process is, probably, mainly due to the more complete removal of the extractive matter soluble both in alcohol and water.

Jalapurgin, as obtained above, when treated with potassium acid chromate and sulphuric acid, took an olive-green color, while the

ether-soluble resin became at first yellowish-brown, and subsequently changed to reddish-brown. Treated with manganic dioxide and sulphuric acid, jalapurgin acquired a rose-pink, but the ether-soluble resin a dark green color.

ABSTRACTS FROM THESES.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy.—

No. 77.

H. L. Hurxthal, Ph.G., examined four brands of *commercial Codeine*, and found them to agree closely with the requirements of the U.S.P., except that they all gave rather dense precipitates with mercuric chloride, while our Pharmacopœia states that no such precipitate should form. As, however, there is abundant authority for the statement that codeine should give a precipitate with mercuric chloride, our standard is evidently in error on this point.

Codeine has recently been much advertised as a cure for the opium habit, and one brand in particular has been extensively advertised as being especially adapted for this purpose on account of its great purity. In all the tests applied, there was no evidence in favor of any special manufacture.

The water present was very near the theoretical 5.6 per cent.

No. 1 gave on drying 5.1 per cent. water.

No. 2 " " 5.3 " "

No. 3 " " 5.6 " "

No. 4 " " 5.6 " "

These residues, after drying, gave the following melting points: No. 1, 150.2° C.; No. 2, 150.1° C.; No. 3, 149.7° C.; No. 4, 149.7° C.

The determinations were made with a thermometer corrected at the Yale Observatory, and closely agree with the U.S.P. requirement of "about 150°." In Beilstein's Organic Chemistry, vol. iii, page 554, the melting points 153° and 155° are quoted, the former on the authority of Grimaux, and the latter on that of Hesse.

Leonard A. Schoppe, Ph.G., investigated a sample of "*artificial gum*," used and sold as a substitute for acacia. In appearance it resembled granular acacia somewhat, but the granules were larger and more transparent. It also differed in having a sweet and only slightly mucilaginous taste.

It was slowly and completely soluble in cold water, forming a neutral solution.

A 10 per cent. solution in water was not precipitated by an equal volume of 95 per cent. alcohol; on adding $1\frac{1}{2}$ volumes it was partly precipitated, and 3 volumes precipitated 67 per cent., which amount was not increased by the further addition of alcohol. It was at first supposed to be a mixture of true gum and sugar. There were found 39 per cent. of total sugar, 11 per cent. of which was directly reducible by Fehling's solution, 7 per cent. of moisture, leaving 54 per cent. to be accounted for as gum. As the ash was only .04 per cent., the presence of that much acacia was out of the question, since 5 or 6 specimens of true acacia were found to yield an average of 3 per cent. of ash. It was also found that longer boiling with acid would give a larger percentage of sugar. It was concluded that this gum was made by a careful treatment of starch with sulphuric acid, so as to partly convert the former, and the acid neutralized with lime, as the ash was found to consist of calcium sulphate.

MICROSCOPICAL NOTES.

BY HANS M. WILDER.

Starch.—On heating it in the presence of water, paste will finally be formed, but this formation does not take place in strong alcoholic liquids, fluid resins (for instance, benzol-balsam) or in essential oils, heating in which liquids does not destroy the individuality of the starch grains. Although cold, moderately strong solutions of potassa or soda soon convert starch into paste, water of ammonia apparently exerts no influence. Carbolic acid destroys it quickly.

Experiments.—As soon as the student of microscopy gets somewhat familiar with the usual methods of mounting, he will, likely enough, try to modify them or, perhaps, strike entirely new paths—that is but human nature. Now, the advice which the writer wants to give is to make a note of every departure from the old methods, however apparently insignificant it may seem to be. The best way is merely to number each slide, etc.; and in a note-book kept for this purpose to enter under that number all necessary remarks. In case the experiment turns out to be a success, these remarks will enable one to repeat it; if the experiment happens to be a failure, the remarks will save much disappointment and loss of

time in the future. The writer was led to this paragraph by several slides, made about a year ago, of which he cannot form the faintest idea of how he made them (previous treatment of substance, stain, medium, etc.), and some of these he should very much like to duplicate.

"Festina lente"—Make haste slowly! Hurry seldom gives good results; take your time in the previous treatment, staining, mounting, etc.

Stains.—These serve a two-fold purpose: First, to make more easily visible extremely thin, colorless and transparent elements (tissues), either directly by staining them, or indirectly by staining the surrounding medium. Secondly, to differentiate the component elements of the object, so as to render them more readily recognizable. This is done with single stains by the different selective power which the various elements possess, some of the latter either not taking the stain at all, or with varying intensity, or with different colors. Double stains act, of course, by selection. For cursory examination the most generally useful single stains are: Methyl violet (purple ink), hæmatoxylin and sulphindigotate of sodium (Arnold's writing fluid does as well); all of which give better results if used much diluted, using longer time. Carmine gives excellent stains, where suitable; but is somewhat troublesome to use properly.

Microscope stands.—These may conveniently be divided into two great classes: Those with facilities for applying substage apparatus, and those without such facilities. The latter class is the cheapest (as low as \$15 with sliding tube), and will do for the first year or two, but since it is impossible to use a polarizing apparatus with them (and pharmacists have quite often use for it), not to mention sundry other pieces of apparatus, the student will sooner or later be forced to either sell his instrument or to exchange for a stand of the first class, either of which means loss of money. It is, therefore, better from the start to get one of the first class. This class may be subdivided into those where the substage apparatus is fastened to a fixed ring under the stage, and those where the ring is movable on the mirror-bar. The latter stands are certainly the handiest, but cost more (from \$30 up); the first ones (with fixed ring) serve all the purposes of even exacting pharmacists, and are much cheaper as low as \$18, with sliding tube). Whatever stand is chosen, it is indispensable that the draw-tube be provided with society screw.

Whether sliding tube or rack and pinion, is merely a matter of convenience and dollars and cents.

German vs. American Microscopes.—With 45 per cent. duty the American instruments are, dollar for dollar, superior to German ones at the same price; of late several American firms have been making stands according to the squat German model for those who prefer short stands.

Book.—Next to a living teacher comes a good manual, and the writer knows of none better or more instructive handbook of microscopical technique than the *Technical History of a Slide*, by Dr. Frank L. James, St. Louis, Mo. He generally gives the "why" and "wherefore" of every step.

Patience.—Without much patience and a corresponding amount of failures few will become expert microscopists. Through failures we learn!

CHEMICAL NOTES.

BY HENRY C. C. MAISCH, Ph.G., Ph.D.

On Cocaine.—A. Einhorn and A. Marquardt (*Ber. d. Deutsch. chem. Gesell.*, 1890, 468) treated ecgonine with potassium hydrate and obtained an isomeric base which is dextrogyre while ecgonine is lævogyre. On treating the methyl ether of this base with benzoyl-chloride a dextrorotary alkaloid isomeric with cocaine was obtained. The alkaloid which C. Liebermann and Giesel noticed in the technical synthesis of cocaine and which they named *methyl-cocaine* (*Ber.*, 1890, 508) seems, according to newer investigations, to be identical with the above alkaloid (*Ber.*, 1890, 926).

The first-named author, A. Einhorn, has succeeded in going from a derivative of cocaine, *anhydroecgonine* C_8H_7 ($CH=CH-COOH$) NCH_3 , to one of atropine, *tropidine* C_8H_7 ($CH=CH_2$) NCH_3 by heating anhydroecgonine with concentrated hydrochloric acid to 280° C. for 8 hours. Among others there is one base formed which yields a gold salt, melting at 212° C. On decomposing this double salt or better the picrate, a base $C_8H_{13}N$ is obtained, which proved to be tropidine. (*Ber.*, 1890, 1338.)

On Cinchonamine.—Arnaud (*Ann. Chim. Phys.* (6) 19 (1890) 93) among other things, in reviewing his work done on this new cinchona alkaloid, gives the following method for estimating nitric acid based on the slight solubility of cinchonamine nitrate. The solu-

tion containing the nitric acid is carefully neutralized with sulphuric acid or sodium hydrate, chlorides are precipitated with silver acetate and the excess of the acetate removed with sodium phosphate. The filtered solution is evaporated almost to dryness, filtered if necessary, slightly acidified with a drop of dilute acetic acid and precipitated while boiling with a warm solution of cinchonamine sulphate. Precipitation takes place immediately, but the solution is set aside in a cool place for twelve hours. The precipitate is then collected on a weighed filter, washed with a cold saturated solution of cinchonamine nitrate (to remove the excess of sulphate) and washed with a small quantity of cold water. The filter is then dried at 100° C. and weighed. 359 pts. by weight of the nitrate represent 54 pts. N_2O_5 . A solution containing $\frac{1}{1000}$ potassium nitrate still yield a precipitate after standing several hours.

The Carbohydrates of the Sweet Potato (Batatas edulis).—W. E. Stone (*Ber. d. Deutsch. chem. Gesell.*, 1890, 1460) found $1\frac{1}{2}$ to 2 per cent. of cane sugar and a large amount of starch.

Myrrh.—O. Köhler (*Arch. d. Pharm.*, 1890, 228, 291) examined this gum resin of the Sumali country. Distillation with water yielded the oil $C_{10}H_{14}O$, 7 to 8 per cent. The residue was dried and treated with absolute alcohol where the gum remained. This has the composition $C_6H_{10}O_5$, is a light yellow, or white powder soluble in water, and is present to the amount of 57 to 59 per cent. The portion soluble in alcohol, which is 33 to 35 per cent. of the whole, contains (1) a soft resin $C_{26}H_{34}O_5$ soluble in alcohol and ether and has three free hydroxyls, and (2) two dibasic resin acids $C_{13}H_{16}O_8$ and $C_{26}H_{32}O_9$.

The Phenol of Oil of Sassafras.—C. Pomeranz (*Monatsh. f. Chem.*, 1890, 101) separated the phenol by shaking the oil with dilute potassium hydrate, precipitating with sulphuric acid, drying and purifying by distillation. Analysis and other properties point toward eugenol, which was verified by preparing and examining the benzoic ester.

Test for Purity of Lard.—F. Jean (*Société chim. de Paris*, June 6, 1890, through *Chem. Zeit.*, 1890, 945) uses the rotatory power of lard, which is 12.5° for detecting adulterations. He claims that 5 per cent. of foreign fat, cotton-seed oil or margarin, can be detected with the polariscope.

Oils of Nutmeg and Mace.—F. W. Semmler (*Ber. d. Deutsch.*

Chem. Gesell., 1890, 1803) found oil of nutmeg, obtained from Schimmel & Co. to contain only terpenes. The oil examined was colorless, specific gravity at $15^{\circ}\text{C.} = 0.8611$. The terpenes, the oil contains several, boil at about 50°C. under 8 mm. pressure. The oil of mace examined was yellow, specific gravity at $14^{\circ}\text{C.} = 0.9309$; neither at ordinary temperature nor on cooling to -10°C. is a solid deposited. The raw oil gives an emerald green color with alcoholic ferric chloride. Distillation at 10 mm. yielded fractions: $35-70^{\circ}$, 53 per cent., is colorless, gives no color reaction with ferric chloride and its specific gravity is 0.8601. This fraction consists of terpenes like those of oil of nutmeg. Wallach found pinene and dipentene. Fraction, $70-114^{\circ}$, 15 per cent., contains myristicol and a small quantity of terpene, is colorless, gives no color reaction, and has the specific gravity 0.9131 at 12°C. Fraction remaining in the flask at 114°C. , 31 per cent., partly crystallizes on cooling, is dark yellow, gives the color reaction with ferric chloride and has the specific gravity 1.0863 at 12°C. This higher boiling fraction was furnished the author by Schimmel & Co., and was further examined by him. The properties were the same as those noted above. It is soluble in concentrated sulphuric acid with a blood red color, and its specific gravity at 14°C. was 1.1303. On distillation the first drop goes over at 124°C. , the principal portion distilling from 148° to 158°C. The color reaction probably being due to a phenol, the oil, to separate this, was treated in vacuum with sodium while cooling, and when the reaction has subsided the liquid must be warmed. Distillation is then carried on at 10 mm. pressure when the oil goes over from 142° to 149°C. On cooling the oil solidifies, ferric chloride yields no color nor has sodium any effect. The specific gravity at 25°C. is 1.1501, and the melting point 30.25°C. Analysis and vapor density determination point to the formula $\text{C}_{12}\text{H}_{14}\text{O}_3$; the author named this stearopten *myristicin*, which is not identical with the body formerly known under that name and which Flückiger found to be myristic acid. Sodium being without affect, the myristicin is very likely an ether.

Balsam of Peru has given excellent results to Dr. Jasinski in cases of local tuberculosis of the bones and skin. It was used in substance or in alcoholic solution as a dressing and as injection into cavities.—*Med. News*, May 10, p. 511.

GLEANINGS FROM THE GERMAN JOURNALS.

BY FRANK X. MOERK, Ph.G.

Preservation of Infusions.—At a pharmaceutical meeting in Christiania, Norway, Dr. E. Larsen exhibited specimens of various infusions—notably digitalis—which were several months old, and had not undergone any changes; the infusion of digitalis was still found to be very effective. The method of preservation was to simply sterilize the infusion and afterwards prevent the introduction of germs; this was accomplished as follows: The infusion was placed in a flask with a doubly perforated cork containing a short, straight tube closed with a plug of cotton, and a syphon-tube with a short piece of rubber and pinch cock, the glass syphon-tube reaching to the bottom of the flask; to sterilize, the infusion is boiled so that steam passes through the cotton for one-half minute, by closing the short tube with a cork for a moment, the syphon-tube being open, the latter fills with the infusion; allowing the pinch cock to close the syphon-tube and removing the cork from the short tube, the infusion can be removed at will, simply by opening the pinch cock; the cotton preventing any germs from entering the flask, but allowing filtered air to take the place of the infusion.—*Pharm. Centralhalle*, 1890, 405.

Glycerinum saponatum, a solution of soap in glycerin is used by von Hebra as a base in various dermal remedies. The soap used is a perfectly neutral cocoanut oil-soda soap or tallow-soda soap, dried at 80°–100° C. The soap is dissolved in glycerin sp. gr. 1.25, using a water bath, and the solution filtered hot; after cooling it forms a pale yellow, odorless elastic mass, melting at the temperature of the body; completely soluble in water it can be used as a base for ointments as well as for lotions; it is hygroscopic and must be preserved in closed vessels. The most useful preparation contains 20 per cent. soap, although, for some purposes, 8 per cent. soap is more desirable. In making medicated preparations the glycerinum saponatum is melted and the medicinal agents incorporated or dissolved.

For the following combinations 80 per cent. glycerin and 20 per cent. soap is used: with *salicylic acid*, 5 per cent.; useful in softening hard skin on hands or feet; with *salicylic acid and resorcin*, 5 per cent. of each; with *salicylic acid and creasote*, 5 per cent. of each; with *salicylic acid and tar*, 3 and 10 per cent.

With 92 per cent. glycerin and 8 per cent. soap are prepared :

Glycerinum saponatum with zinc oxide (95 : 5), forms a fine white mass, permanent in air ; it is so firm that it must be scraped with a spatula, but placed upon the skin it softens and can be rubbed up completely, especially in presence of a little water. It is used for chapped hands ; for eczema the following is more desirable : *Glycerinum saponatum* 78, zinc oxide 20, and starch 2.

Glycerinum saponatum with iodoform (95 : 5) ; much more iodoform can be introduced. It forms a hard mass, which must be scraped with a spatula ; placed upon sores it liquefies and penetrates into all parts of the wounds. There is noticeable in the preparation a marked reduction of the iodoform odor.

Also combinations *with sulphur*, 10 per cent. ; *with sulphur and zinc oxide*, 10 and 20 per cent. respectively ; *with chrysarobin*, 10 per cent. ; *with hydroxylamine*, 1 per cent. ; *with ichthyol*, 5 per cent. of the ammonium salt ; *with ichthyol and zinc oxide*, 10 per cent. of each ; *with carbolic acid*, generally 2 or 3 per cent. of the latter.—(*Ztschr. f. Therap.*) *Pharm. Centralhalle*, 1890, 415 and 444.

Ozonin, a bleaching fluid, patented by L. Schreiner, is made as follows : 125 parts resin are dissolved in 200 parts oil of turpentine ; to this solution is added a solution of 22.5 parts potassium hydrate in 40 parts water, also 90 parts hydrogen peroxide. The resulting jelly exposed to light changes in 2 or 3 days into a thin fluid called *ozonin* ; this same change takes place in the dark, but then requires some weeks for its completion. An emulsion of one gram *ozonin* in one liter water acts as an energetic bleaching agent on fibres, wood, straw, cork, paper ; also, on solutions of gums and soaps ; the bleaching effect is as energetic in acid as in alkaline solutions.—*Chemiker Ztg.*, 1890, 1004.

Codeine phosphate appears in commerce of various composition. By neutralizing codeine with phosphoric acid and crystallizing from water, or precipitating the solution with alcohol, the salt had the composition $C_{18}H_{21}NO_3H_3PO_4 + 2H_2O$; but if crystallized from hot dilute alcohol $2(C_{18}H_{21}NO_3H_3PO_4) + H_2O$. Both are found among the commercial article.—E. Schmidt, *Apoth. Ztg.*, 1890, 366.

Benzosol, the benzoic ether of guaiacol, has been prepared by Dr. Bongartz and recommended as a tasteless substitute for the locally irritating guaiacol. Taken into the system it is slowly saponified by the gastric juice and the liberated guaiacol is under the most

favorable conditions for absorption. It has the formula $C_6H_4(OCH_3)O-COC_6H_5$. For its preparation crude guaiacol is converted into the potassium salt, which is then purified by crystallization from alcohol; heated with the calculated quantity of benzoyl chloride the potassium-guaiacol forms benzosol and potassium chloride. After recrystallization from alcohol it forms small colorless crystals, melting at 50° , almost odor- and tasteless, insoluble in water, but soluble in alcohol and ether.—(*Südd. Ap. Ztg.*) *Apoth. Ztg.*, 1890, 389.

The specific gravity of waxes, resins and solid fats is easily and rapidly determined by taking a cylindrical piece 1–1.5 cm. long and 0.5 cm. diameter (made by pouring the melted substance into a proper mould), weighing it, placing it in a dry, narrow-necked small flask of known capacity and allowing water to run in from a burette; the substance should lay horizontally in the flask, so that when the water is added it does not rise into the neck of the flask. The weight of substance divided by its own volume of water gives the desired specific gravity. If the weight of the substance is 0.624, the capacity of the flask 25 cc., and after introducing the fat only 24.3 cc. water are required to fill the flask up to the same point, then $\frac{0.624}{0.7} = 0.891$ is the specific gravity. The temperature

should be kept at 15° C. during the determination.—Gawalowski (*Oel u. Fett Ind.*) *Pharm. Ztg.*, 1890, 427.

Detection of Nitrates in Iodide of Potassium.—0.1 gm. potassium iodide and 1.0 gm. copper sulphate are dissolved in 10 cc. water, heated to the boiling point, sulphurous acid added until the brown precipitate becomes white and filtered. The filtrate can then be tested for nitrate with sulphuric acid and ferrous sulphate.—Schürholz, *Pharm. Ztg.*, 1890, 427.

Honey.—Dr. Oscar Haenle, after long series of experiments, announces the discovery of a method enabling the recognition of a pure or adulterated honey. It is based upon the dialysis of the honey diluted with water and after some hours, testing the liquid in the dialyzer by polarized light; no matter if the pure honey is dextro- or lævogyre, after dialysis it is found that the liquid remaining in the dialyzer will be inactive; adulterated or artificial honey, on the other hand, always will leave a dextrogyre liquid in the dialyzer, no matter how long the diffusion is allowed to proceed. The rotatory power is due to dextrin or dextrin-like bodies present

in the glucose used for adulteration. To insure reliable results, the liquid is tested from hour to hour until the rotation remains constant.—*Pharm. Ztg.*, 1890, 441.

Mucilage of Gum Arabic.—To make a clear, almost odorless and permanent mucilage Francke neutralizes the free acid present in the gum with lime water. Instead of water he uses a mixture 20 per cent. lime water and 80 per cent. distilled water.—*Pharm. Ztg.*, 1890, 457.

Atropamine is a new alkaloid found by Hesse in belladonna root, where it is occasionally present in considerable quantity. It is amorphous, melts at 60° C., is easily soluble in alcohol, ether and chloroform, has the formula $C_{17}H_{21}NO_2$ (differing from atropine, hyoscyamine and hyoscyne by containing one H_2O less; but, identical with pure belladonnine). It differs from the other belladonna alkaloids by forming beautifully crystallized haloid salts; it is optically inactive; the hydrochlorate in 2 per cent. solution is not mydriatic. Atropamine is only decomposed by prolonged boiling with alcoholic baryta solution, yielding tropine and an unknown acid, which may under some conditions re-arrange its atoms to form cinnamic or isocinnamic acid. Mineral acids easily bring about the decomposition but first convert the atropamine into belladonnine; this easy decomposition may explain why the alkaloid was not sooner discovered as it is easily isolated. It is precipitated from its salts by ammonia, potash and soda as oily drops.—*Pharm. Ztg.*, 1890, 471.

Precipitated red oxide of mercury.—The publications of Vielhaber and Jehn that the red oxide of mercury made from the nitrate was often, if not always, contaminated with metallic mercury induced Dr. Bosetti to attempt its preparation by precipitation. By using a boiling solution of mercuric chloride (1 : 4), adding baryta solution until the brown precipitate turns red, and washing, red oxide was obtained. The objection to the product is that while free from chlorine, it always contains baryta. A red oxide of deep orange color can be obtained by using NaOH in place of $Ba(OH)_2$, avoiding an excess of NaOH. Like the officinal red oxide it does not change its color if warmed on a water-bath with oxalic acid solution.—*Pharm. Ztg.*, 1890, 471.

Nux Vomica Assays.—10 gm. of the powdered seeds are exhausted in an extraction apparatus with a mixture of 75 parts chloroform and 25 parts spirit of ammonia, the chloroform recovered by distillation, the residue, after dissipation of the

alcohol, taken up with a mixture of 5 cc. each of water, alcohol and 10 per cent. aqua ammoniæ and this solution extracted three times with 20, 10 and 10 cc. chloroform respectively. The chloroform is distilled off, the residue, freed from ammonia by heating on a waterbath, is dissolved in 15 cc. $\frac{1}{10}$ n hydrochloric acid, the solution warmed for 5 minutes on a waterbath, filtered, the filter washed with hot water until the washings are free from acidity and the excess of acid determined with $\frac{1}{100}$ n soda solution. By subtracting the required cc. of NaOH from 150, the number of cc. of $\frac{1}{100}$ n HCl required to neutralize the alkaloids in 10 gm. seeds is obtained. 1 cc. $\frac{1}{100}$ n HCl corresponds to 0.00367g alkaloid assuming strychnine and brucine to be present in equal proportion. In ten determinations the results varied between 2.17 per cent. and 2.38 per cent.

Nux vomica obtained from different countries were examined to ascertain the alkaloidal percentages: Bombay, 2 samples, 2.33 and 2.30 per cent.; Malabar, 1 sample, 2.62 per cent.; Cochin, 3 samples, 2.51 per cent, 2.41 per cent. and 2.81 per cent.; Madras, 2 samples, 3.42 per cent. and 1.53 per cent.; Calcutta, 1 sample, 2.40 per cent.

Extract of Nux Vomica is assayed by dissolving 2 gm. of the extract in 5 cc. each of water and water of ammonia and 10 cc. alcohol and agitating with chloroform, etc., as above.

Tincture of Nux Vomica.—50 cc. are evaporated to dryness and proceeded with under the extract.

To determine relative percentages of brucine and strychnine, the total alkaloids must be purified; this is accomplished by evaporating the solution of the mixed alkaloids from the total alkaloid estimation to dryness after addition of some ammonia, dissolving the residue in alcohol with the aid of heat, filtering, evaporating to dryness, redissolving in water containing HCl, adding $\frac{1}{3}$ alcohol to the solution, and an excess of ammonia and agitating with three portions of chloroform of 20, 10 and 10 cc. respectively. The residue from the chloroform solutions is taken up with $\frac{1}{10}$ n HCl and its excess determined with $\frac{1}{100}$ n NaOH. From the quantity of acid required the total alkaloid remaining after purification is calculated. The solution is evaporated to 25 cc., strongly acidulated with HCl, and then precipitated with a one per cent. solution of potassium ferrocyanide (the value of which has been definitely ascertained by use of a weighed quantity of strychnine) until a drop of the solution

placed upon ferric chloride paper gives a blue color. From the cc. $K_4Fe(CN)_6$ is calculated the amount of strychnine and the cc. $\frac{1}{100}n$ HCl equivalent to it. The cc. $\frac{1}{100}n$ HCl corresponding to strychnine is subtracted from the cc. $\frac{1}{100}n$ HCl necessary for the purified total alkaloids and the remainder multiplied by 0.00394 gives the quantity of brucine. From these relative quantities are then calculated the percentages of the two alkaloids. There is a loss in purifying the alkaloids, but this by experiment has been found not to alter the relative percentages of the two alkaloids. In five extracts examined the ratio of strychnine and brucine varied from 42 : 58 to 54 : 46. Taking a normal extract with 15 per cent. total alkaloid the percentage of strychnine might vary from 6.3 per cent. to 8.1 per cent., or 1.8 per cent. If the physiological action of strychnine and brucine is as given by Falk 1 : 38.5 then little is accomplished by a total alkaloid determination; it would be more to the point to require a fixed percentage of strychnine and disregard the brucine (of which an equal quantity could always be assumed). An extract with fixed strychnine percentage and a brucine percentage varying within 1.8 per cent. is undoubtedly more reliable than an extract containing a fixed quantity of total alkaloid in which the strychnine present might vary 1.8 per cent.—H. Beckurts, *Arch. der Pharm.*, 1890, 330-347.

REMARKS ON QUININE, CINCHONIDINE AND THEIR ISOMERS.¹

BY DR. O. HESSE.

It has recently been suggested that there is need of more accurate determinations of the melting points of anhydrous quinine prepared in different ways, and as the data specially referred to were those obtained by Dr. Hesse he has repeated his previous observations, and in publishing his results has taken the opportunity to add some remarks in reference to the corresponding varieties of cinchonidine.

Dr. Hesse had given two data for the melting point of anhydrous quinine, one relating to precipitated alkaloid that had been dried in an exsiccator, the other to anhydrous quinine obtained by direct crystallization. In the latter instance the observed melting point,

¹*Annalen der Chemie*, vol. cclviii, p. 133. Reprinted from *Phar. Jour. and Trans.*, July 12.

177° C., was given, and in the former the corrected temperature 176.8° C. The correction may have amounted to 3 or 4 degrees, so that the observed temperature would have been about 173° C. According to these observations the melting point of the anhydride would be decidedly the higher. The difference may, however, have been due to defects in the thermometers used, and, Dr. Hesse has therefore tested the thermometer used in his latest observations by comparing it with a normal instrument in the Physicotechnica Institute at Charlottenburg and in addition has made use of Roth's apparatus to prevent any possible error. Although this apparatus does not give at once the absolute melting point, the direct observation is such a close approximation to it that the differences are within the limit of observation, error and correction may therefore be dispensed with.

Of the two preparations previously operated with only the quinine anhydride was available for further examination and that gave in several experiments a melting point of 174.4° to 175° C.

The trihydrate prepared for the other determination was crystallized from dilute alcohol in long silky needles. The anhydrous alkaloid obtained from it by drying in an exsiccator, and finally at a temperature of 120° C., melted at 172° C. The same substance was also obtained in compact needles by crystallization from ether, and after drying is melted at 171.2° to 172° C. The same hydrate prepared by precipitating a dilute water solution of quinine sulphate with caustic soda and also with ammonia gave after drying at 115° C., as the melting point of the dry base 172° and 171.4° respectively. Lastly, the base obtained by heating the benzene compound $C_{20}H_{24}N_2O_2C_6H_6$ to 120° C., until free from benzene, gave from 171.6° to 172° C.

The melting point of the anhydrous base obtained by direct crystallization is therefore on the average 174.7° C., and that of the base obtained by heating the trihydrate or the benzene compound is about 171.8° C. In some recent experiments Lenz found the melting point of the base obtained from the benzene compound to be 171° C., that of pure quinine obtained by precipitation being from 170.4° to 174.4° C. and he suggested that the differences might be due to a mixture of amorphous and crystalline quinine, but it was probably in most instances a mixture of ordinary quinine with the higher melting anhydride that he operated upon. The anhy-

dride is formed when solutions of quinine in certain indifferent solvents, such as dilute alcohol, are exposed for a long time to a temperature of 30° C.; and it is again converted into ordinary quinine when subjected to the continued action of dilute sulphuric acid. When the anhydride is dissolved with moderately warm dilute sulphuric acid in the corresponding molecular proportions, only ordinary quinine sulphate crystallizes on concentrating the solution, so that there is in that case a rapid conversion of the one form of base into the other.

In addition to the former statement of the differences between ordinary quinine and the crystalline anhydride Dr. Hesse adds that, as he then suggested, they are to be regarded as isomeric forms of this base, and in order to distinguish them he proposes to call the higher melting base homoquinine. Although this name has already been applied by Howard and Hodgkin to a substance that afterwards proved to be a compound of quinine with another base, its appropriation in that sense has now been done away with.

The relations between cinchonidine and homocinchonidine are similar to those obtaining between quinine and homoquinine. The confusion of those two bases that is still met with in chemical literature makes a brief reference to the history of both substances desirable. In 1877, Dr. Hesse showed the difference between these bases by the behavior of their neutral sulphates, but assigned to homocinchonidine the formula $C_{10}H_{22}N_2O$, that is now adopted, and to cinchonidine the old formula $C_{20}H_{24}N_2O$, expecting that his further investigations would clear up this point.

Anticipating that result, however, Skraup and Vortmann published a paper on "cinchonidine," in which, contrary to their intention, they dealt with homocinchonidine instead of cinchonidine, and it was not until a later period that Skraup recognized the identity of homocinchonidine with the base to which Dr. Hesse had given that name. The fact that Skraup and Vortmann were working with homocinchonidine, and not as they thought with cinchonidine, is shown by their misinterpretation of a statement as to the solubility of homocinchonidine in ether attributed to Koch by Skraup, but which was never made by Koch. In consequence of this misunderstanding, Skraup and Vortmann got rid of the cinchonidine, and retained the homocinchonidine, which they examined and described as being cinchonidine.

Hence it follows that the existence of homocinchonidine was not placed in doubt, as de Vrij has supposed, by the paper of Skraup and Vortmann, but on the contrary it was proved, and it was really the existence of the base to which Dr. Hesse gave the name of cinchonidine that was disputed. Subsequently, indeed, Skraup endeavored to prove the non-existence of this latter base by means of preparations obtained from Dr. Hesse. In regard to that attempt it is a sufficient justification of Dr. Hesse's view that two years ago de Vrij unintentionally supported the existence of the base which Dr. Hesse had named cinchonidine by making known a simple method of preparing it.

In reference to this communication of de Vrij's, Dr. Hesse mentions that he had from time to time prepared the tetrasulphate originally described by him, recrystallizing it from dilute sulphuric acid or from alcohol, then neutralizing the water solution, and separating from the sulphate deposited the still adhering homocinchonidine by means of recrystallization from water in the manner that has been described. A pure cinchonidine salt may be obtained even by repeated recrystallization of the tetrasulphate from dilute sulphuric acid or alcohol, as shown by Dr. Hesse more than ten years ago, so that this fact was already known in 1887 when de Vrij supposed it had been discovered by Schäfer. The uncorrected melting point of cinchonidine was found, as previously stated by Dr. Hesse, to be from 199.7° to 200.5°C. (mean about 200.1°C.), when determined by the method then in use (Clauss gives 201°C. , Schäfer 199°), and that of homocinchonidine was found to be from 205°C. to 206°C. , or nearly six degrees higher than the melting point of cinchonidine. By the use of Roth's apparatus the melting point of cinchonidine was found to be from 202°C. to 202.8°C. , mean 202.4°C. , and that of homocinchonidine from 207° to 208.2°C. , mean 207.6° . By the same means, Lenz, without attempting a separation of homocinchonidine from cinchonidine, found the melting point of the base obtained from once recrystallized tetrasulphate to be from 207°C. to 207.5°C. , that of twice recrystallized salt 204.5° to 205°C. , and that of the base crystallized from ether 205°C. to 206°C. , while that of a sample of cinchonidine obtained from Dr. Hesse was found to be 204.5°C. to 205.2°C. , or in all instances higher than that of cinchonidine. Whether these differences were due to the presence of some homocinchonidine or to other circumstances it

is impossible to say, but in any case the mean values of 205.1°C . and 207.2°C . (corrected) adopted by Lenz for cinchonidine and quoted in Beilstein's "Handbook," are to be rejected as inappropriate.

When pure cinchonidine is dissolved in moderately warm sulphuric acid containing 25 per cent. H_2SO_4 , in the proportions of 1 gram to 8 cc., the greater part crystallizes on cooling the solution in the form of tetrasulphate, and on examination of the base obtained from that salt as well as from the mother liquor both will be found to have the same melting point as the original base; under those conditions there is no alteration of the base. When homocinchonidine is treated in the same manner there is a similar though not quite so large a crystallization, but in this case the base separated from the mother liquor has a melting point of about 206°C . and that obtained from the crystals melts at 203° to 204° . By further recrystallization of the salt from dilute sulphuric acid pure cinchonidine tetrasulphate may easily be obtained. When the same treatment is applied to the base obtained from the mother liquor a further quantity of cinchonidine tetrasulphate is obtained. By this means it is not difficult to convert almost entirely into cinchonidine the homocinchonidine remaining in the last mother liquor together with some cinchonidine.

On the other hand, cinchonidine may be easily converted into homocinchonidine. When the above-mentioned solution is heated in a closed tube to 140°C . for six or eight hours no crystallization takes place on cooling, and it is easy to ascertain from the melting point of the base in that case and from the behavior of the neutral sulphate, that homocinchonidine is present. The acid solution will often remain for several days in this condition; after a time crystallization commences and proceeds more or less rapidly, indicating the reconversion of homocinchonidine into cinchonidine. The change may be accelerated by dropping a crystal of cinchonidine tetrasulphate into the solution, and thus it is perfectly easy to prepare homocinchonidine from cinchonidine or the reverse.

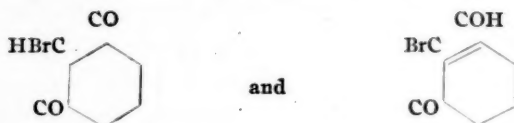
The two bases are distinguishable, apart from other differences, by their melting points being nearly six degrees different; but the statements published as to this particular might still more differ from each other if the melting points are not determined in the same manner. Dr. Hesse's former data of 199.7° to 200.5° apply to

the uncorrected melting point of cinchonidine determined according to the method then adopted, while Skraup and Vortmann give 210.5° as the corrected melting point of their cinchonidine that was in fact homocinchonidine. In several handbooks both substances have, in consequence of the statement of Skraup, de Vrij and others, been confused together under the name of cinchonidine, and thus there have naturally been great differences between the statements as to melting point. Dr. Hesse, however, disclaims responsibility for these discrepancies, since he has repeatedly insisted upon the difference between the two bases and their melting points.

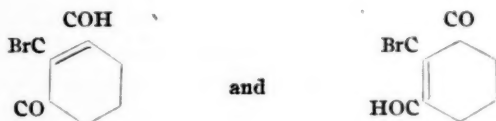
The above-described conversion of cinchonidine into homocinchonidine calls to mind the β -cinchonidine which Dr. Hesse obtained under similar conditions from cinchonidine by means of hydrochloric acid. It had a melting point from 206° to 207° C., but then became brown, polarized in acid solution rather more strongly than homocinchonidine, and gave a neutral sulphate having great similarity to homocinchonidine sulphate, but much more soluble in water than it is. A small quantity of this base that still remains has meanwhile become yellow-colored. Both cinchonidine and homocinchonidine prepared at the same period have remained for ten years quite colorless; and it is therefore probable that the discoloration was due to some admixture which was not removed. Lenz also observed that his cinchonidine became somewhat brown on melting, though this is never the case with the pure base. If the above-mentioned β -cinchonidine was, as Dr. Hesse conjectures, chiefly homocinchonidine, it would be possible to reconvert it into cinchonidine as already described, and that was found to be the case, nearly three-fourths of the substance separating in the form of tetrasulphate, which could easily be recognized as a cinchonidine salt. From this observation it must therefore be inferred that by heating cinchonidine with hydrochloric acid of 1.125 sp. gr. to 140° C. the base is at first converted into homocinchonidine, which is then further changed into apocinchonidine. When sulphuric acid of the suitable strength is used this alteration does not proceed beyond the first stage.

The behavior of these bases strikingly recalls that of the mutually convertible bromtetraethyl phloroglucines which Hirzig and Zeisel obtained by the action of bromine upon tetraethyl phloroglucine.

These compounds are regarded by them as desmotropic to each other and having the following structural formulæ:—



Dr. Hesse is disposed to view these substances as identical in structure, but isomeric from a stereochemical point of view as shown below:



in much the same manner that Skraup and Würstl assume quinine, quinidine (conchinine) and quinicine to be. That quinine, as well as cinchonidine, each contains at least one double carbon bond is shown by the occurrence of hydroquinine and hydrocinchonidine; but it remains to be determined whether the above-mentioned relations between quinine and homoquinine, as well as cinchonidine and homocinchonidine, would be satisfactorily accounted for by the assumption of a change in the situation of that bond.

ULEXINE AND CYTISINE.¹

By A. W. GERRARD AND W. H. SYMONS, Pharmaceutical Chemists.

Professor Kobert has drawn attention to what he considers the close resemblance between cytisine, the alkaloid of *C. Laburnum*, as described by Husemann and Marmé, and ulexine, the alkaloid of *Ulex europæus*, described by us, and he appears to think that if analyzed by the same hands these two substances would be found to be identical. Will you therefore allow us a little space to enumerate some physical differences which, if the properties assigned to cytisine are correct, alone prove them to be separate bodies, even if the chemical evidence is not considered sufficient to show them to be distinct alkaloids.

¹ From *Phar. Jour. and Trans.*, June 14, 1890, p. 1017.

For convenience we will tabulate these differences :

CYTISINE.	ULEXINE.
$C_{20}H_{27}N_3O$.	$\frac{1}{2}C_{22}H_{28}N_4O_2$.
Permanent in air.	Very hygroscopic.
Sublimes completely, forming splendid crystals.	Refuses to sublime in air without decomposition, and when heated <i>in vacuo</i> does not sublime to any extent at 225° C.
Scarcely soluble in chloroform.	Freely soluble in chloroform.
Formula weight 324.41.	Formula weight $\times 2$, 379.34.

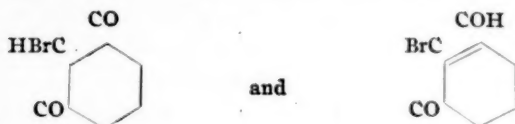
These results, as regards ulexine, we have carefully repeated, and have made the test *in vacuo* even more severe, by enclosing the alkaloid in a vacuumous tube bent twice at right angles and surrounding one limb with small fragments of ice, while the other containing the alkaloid was immersed with a thermometer in a double bath of syrupy phosphoric acid, which we find to be the best liquid for high temperature work. Only a few small crystals were formed above the heated portion of the tube. The temperature of the bath was slowly raised to about 300° C., when the alkaloid appeared to boil ; it gave off bubbles of gas and a small quantity of colorless liquid distilled over. When cooled by ice and opened under mercury the tube was found to contain a considerable quantity of carbon dioxide. This, we think, proves that neither in air nor *in vacuo* can ulexine be sublimed unchanged.

That ulexine and cytisine have much in common there can be no doubt, but so they have with eserine and sparteine, both of which are alkaloids obtained from plants belonging to the same natural order, and in percentage composition they are not far removed from pyridine, nicotine and pilocarpine. The following table arranged according to the percentage of carbon is instructive :

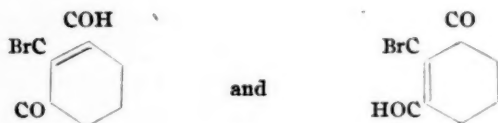
	Carbon.	Hydrogen.	Nitrogen.	Oxygen.
*Sparteine ($C_8H_{13}N^2$), . . .	78.05	10.57	11.38	—
Pyridine (C_5H_5N),	75.90	6.34	17.76	—
Nicotine ($C_{10}H_{14}N_2$), . . .	74.08	8.64	17.28	—
*Cytisine ($C_{20}H_{27}N_3O$), . . .	73.85	8.31	12.92	4.92
*Ulexine ($C_{11}H_{14}N_2O$), . . .	69.42	7.38	14.77	8.43
*Eserine ($C_{18}H_{21}N_3O_2$), . .	65.49	7.64	15.27	11.60
Pilocarpine ($C_{11}H_{16}N_2O_2$), .	63.42	7.71	13.50	15.37

It is to be noted that when arranged in this way there is a difference of approximately 4 per cent. in carbon less, and an increase of

These compounds are regarded by them as desmotropic to each other and having the following structural formulæ:—



Dr. Hesse is disposed to view these substances as identical in structure, but isomeric from a stereochemical point of view as shown below:



in much the same manner that Skraup and Würstl assume quinine, quinidine (conchinine) and quinicine to be. That quinine, as well as cinchonidine, each contains at least one double carbon bond is shown by the occurrence of hydroquinine and hydrocinchonidine; but it remains to be determined whether the above-mentioned relations between quinine and homoquinine, as well as cinchonidine and homocinchonidine, would be satisfactorily accounted for by the assumption of a change in the situation of that bond.

ULEXINE AND CYTISINE.¹

By A. W. GERRARD AND W. H. SYMONS, Pharmaceutical Chemists.

Professor Kobert has drawn attention to what he considers the close resemblance between cytisine, the alkaloid of *C. Laburnum*, as described by Husemann and Marmé, and ulexine, the alkaloid of *Ulex europæus*, described by us, and he appears to think that if analyzed by the same hands these two substances would be found to be identical. Will you therefore allow us a little space to enumerate some physical differences which, if the properties assigned to cytisine are correct, alone prove them to be separate bodies, even if the chemical evidence is not considered sufficient to show them to be distinct alkaloids.

¹ From *Phar. Jour. and Trans.*, June 14, 1890, p. 1017.

For convenience we will tabulate these differences:

CYTISINE.	ULEXINE.
$C_{20}H_{27}N_3O$.	$\frac{1}{2}C_{22}H_{28}N_4O_2$.
Permanent in air.	Very hygroscopic.
Sublimes completely, forming splendid crystals.	Refuses to sublime in air without decomposition, and when heated <i>in vacuo</i> does not sublime to any extent at 225° C.
Scarcely soluble in chloroform.	Freely soluble in chloroform.
Formula weight 324.41.	Formula weight $\times 2$, 379.34.

These results, as regards ulexine, we have carefully repeated, and have made the test *in vacuo* even more severe, by enclosing the alkaloid in a vacuum tube bent twice at right angles and surrounding one limb with small fragments of ice, while the other containing the alkaloid was immersed with a thermometer in a double bath of syrupy phosphoric acid, which we find to be the best liquid for high temperature work. Only a few small crystals were formed above the heated portion of the tube. The temperature of the bath was slowly raised to about 300° C., when the alkaloid appeared to boil; it gave off bubbles of gas and a small quantity of colorless liquid distilled over. When cooled by ice and opened under mercury the tube was found to contain a considerable quantity of carbon dioxide. This, we think, proves that neither in air nor *in vacuo* can ulexine be sublimed unchanged.

That ulexine and cytisine have much in common there can be no doubt, but so they have with eserine and sparteine, both of which are alkaloids obtained from plants belonging to the same natural order, and in percentage composition they are not far removed from pyridine, nicotine and pilocarpine. The following table arranged according to the percentage of carbon is instructive:

	Carbon.	Hydrogen.	Nitrogen.	Oxygen.
*Sparteine ($C_8H_{13}N^?$), . . .	78.05	10.57	11.38	—
Pyridine (C_5H_5N),	75.90	6.34	17.76	—
Nicotine ($C_{10}H_{14}N_2$), . . .	74.08	8.64	17.28	—
*Cytisine ($C_{20}H_{27}N_3O$), . . .	73.85	8.31	12.92	4.92
*Ulexine ($C_{11}H_{14}N_2O$), . . .	69.42	7.38	14.77	8.43
*Eserine ($C_{15}H_{21}N_3O_2$), . .	65.49	7.64	15.27	11.60
Pilocarpine ($C_{11}H_{16}N_2O_2$), .	63.42	7.71	13.50	15.37

It is to be noted that when arranged in this way there is a difference of approximately 4 per cent. in carbon less, and an increase of

over 3 per cent. in oxygen, between each member of this group of alkaloids of leguminous plants. Furthermore, their physiological action, as far as we are capable of judging, seems to become more powerful as the percentage of carbon decreases; the dose of sparteine sulphate being 0.1 gram, and that of eserine sulphate 0.003 gram, and intermediate to these are cytisine and ulexine. They likewise become more unstable in the same order, thus: Sparteine may with care be distilled unchanged; cytisine may, we are told, be sublimed, yielding splendid crystals; but ulexine becomes red on continued exposure to air, and rapidly decomposes at a temperature a little above its melting point. Eserine is still more unstable, its decomposition product (rubreserine) having been examined and described, and it is entirely decomposed at 100° C.

We do not know that any special relationships exist between nicotine and the other alkaloids we have mentioned, but it is a singular fact that the formula we have given to ulexine only differs from that of nicotine by CO, and that if the formula usually ascribed to eserine be multiplied by two and that of nicotine by three the difference is O₄. The elements of water added to the formula for ulexine give us the formula for pilocarpine, and these alkaloids have a physiological likeness, although quite different in their behavior to chemical reagents.

We are at present engaged on the preparation of cytisine, and hope soon to be able to report the results of our examination of this alkaloid.

LONDON, June, 1890.

THE TOXIC PRINCIPLE OF PYRETHRUM FLOWERS.¹

BY MESSRS. SCHLAGDENHAUFFEN AND REEB.

The authors having been for some time occupied in a pharmacological and chemical investigation of pyrethrum flowers from different sources have been induced by the publication of Hirschsohn's paper upon the subject (see *Pharm. Journ.*, May 3, p. 892) to make known their results, so far as they apply to the toxic principle.

A quantity of 250 grams of powdered pyrethrum flowers was distilled in a current of steam until 750 grams of aqueous distillate,

¹ *Journal der Pharmacie von Elsass-Lothringen*, June, p. 123. Reprinted from *Phar. Jour. and Trans.*, July 26.

charged with essential oil, had been collected. After filtration through a moistened filter the filtrate was shaken with ether, the ethereal solution separated, filtered and evaporated at a temperature below 30° C., until there remained in the capsule a small quantity of water and a few small green drops. The aqueous portion, separated by means of a moistened filter, had an odor of black tea, was slightly acid to litmus, but did not appear to incommode insects. The green drops were toxic, but did not contain any alkaloid.

In a second operation the distillate was treated under the same conditions with chloroform, which left upon evaporation an acid and toxic residue.

The same acid compound was also obtained under other conditions. For instance, the powder was submitted to displacement with amylic alcohol, the amylic liquor shaken with water in a separator, the aqueous layer removed, filtered and neutralized with baryta water; then heated on a water bath to drive off the amylic alcohol dissolved in the water, after which it was filtered and the baryta saturated with sulphuric acid in excess. Finally, the liquid was shaken with ether, and upon evaporation of the ethereal liquid there was obtained a greenish acid residue, partially soluble in water and giving a solution having insecticidal properties. If instead of amylic alcohol ordinary alcohol were used the same result was arrived at.

In another experiment the pyrethrum powder was moistened with alcohol containing a little acid, then dried and afterwards exhausted with ether. The ethereal solution was treated with ammonia water, and the latter separated, filtered and evaporated to dryness. The residue was redissolved in water, and after filtration it contained in solution the ammoniacal salt of the toxic acid of pyrethrum powder. The solution was toxic to insects, and gave with silver nitrate, neutral lead acetate, or neutral lead acetate in alcoholic solution an abundant precipitate; with barium nitrate, calcium sulphate or ferric chloride no precipitate.

In another operation 200 grams of powdered pyrethrum flowers was displaced with a litre of chloroform. The solvent was recovered by distillation, and the residue was worked up with water to free it from an inactive substance. The extract was afterwards taken up with 90° alcohol, and the alcoholic liquid filtered and

evaporated. The residue treated with water and ether under suitable conditions yielded the toxic acid as an amorphous and hygroscopic mass. In order to obtain the inactive acid in a pure state the impure acid was taken up with water, and the solution allowed to stand twenty-four hours; then it was shaken with ether to remove a resinous matter, filtered and evaporated. The residue again taken up with water and the solution filtered and evaporated gave the acid in a pure condition.

The acid nature of the active principle having been thus established, it was sought to isolate it by converting it into a lead salt, and for this purpose an alcoholic solution of it was precipitated successively with neutral lead acetate and triplumbic acetate. The two precipitates, well washed, were suspended in alcohol and treated separately with sulphuretted hydrogen; after filtration the solutions were saturated with caustic potash, evaporated to dryness, redissolved in acidulated water and the solutions shaken with ether. In this way were obtained a non-toxic acid, corresponding to the precipitate thrown down by the neutral acetate, and another acid, corresponding to the precipitate by the tribasic acid, which inconvenienced insects only, without killing them. The toxic principle appeared to have escaped during this mode of operating.

Another method was therefore tried, consisting in treating the chloroformic extract first with water to remove the inactive extract, then with five successive quantities of dilute alcohol, increasing in alcoholic strength from one part in ten to five in ten. These alcoholic solutions contained the whole of the toxic principle. They were mixed together, neutralized exactly with caustic potash solution and evaporated carefully to dryness. The residue was taken up with water and the solution filtered, which took some time. The clear liquor was then shaken with a solution of tartaric acid in a separating funnel, and then with ether. The supernatant layer, filtered and evaporated, left an acid and poisonous greenish residue of "pyrethrotoxic acid." The lower layer, which had already been shaken with ether, was again treated with chloroform, which also took up a certain quantity of the toxic principle.

En résumé, the active principle of pyrethrum flowers is an acid soluble in alcohol, amylic alcohol, ether and chloroform, which may be isolated by means of ether after having been converted into an alkaline salt and decomposed by tartaric acid in aqueous solution.

When pyrethrotoxic acid was hypodermically injected into animals, it was observed that the poison produced its effects in two distinct stages. In the first there was an excitement more or less pronounced, proportional to the quantity administered; in the second there was a complete prostration, accompanied always by paralysis of the lower extremities, which might disappear after a time, or be the precursor of a fatal issue, the respiration and circulation being affected only in the latter case.

ON CEDAR GUM (*CEDRELA AUSTRALIS*, F.v.M.).¹

By J. H. MAIDEN, F.L.S., F.C.S.

The well-known "Cedar" or "Red Cedar," of New South Wales and Queensland, is the produce of a *Cedrela*, but in regard to the species there is a difference of opinion. Bentham (B.Fl., i, 387) considers it to be identical with *C. Toona*, Roxb., the Indian toon tree, which produces "Moulmein Cedar" and one of the "Chittagong woods." Baron von Mueller, on the other hand, created a new species for it (*C. australis*, F.v.M.) It is very certain the affinities of the two trees are very close, and it becomes interesting to see if examination of any of their products tends to throw any light on the subject.

The writer is not aware that the finding of gum on the New South Wales cedar has hitherto been recorded, but a collector sent to the Technological Museum a small quantity recently. An old cedar-getter says that trees well exposed to the sun (? in unsuitable situations) yield most gum.

It is a very pale yellow gum, almost colorless, and in thin tears about an inch long. Between the teeth it almost feels leathery. It swells up largely in cold water, but in the course of twenty-four hours it nearly wholly dissolves, forming a solution colorless and faintly cloudy, like good gum arabic, and leaving a small percentage of metarabin.

It is one of the gums which form a connecting link between the arabin group—those gums which dissolve almost immediately in water, and the metarabin group—those which merely swell up in that liquid. It forms a fair mucilage, and on account of its freedom

¹ From vol. iv. (series 2d), of the *Proceedings of the Linnean Society of New South Wales*. Reprinted from *Phar. Jour. and Trans.*, June 28, 1890, p. 1063.

from color it would be a valuable commodity if obtainable in any quantity. An analysis gave the following result:

Arabin,	68.3
Metarabin,	6.3
Hygroscopic moisture,	19.54
Ash,	5.16

Here we have a true gum, without so much as a trace of resin.

Following is the evidence the author has been able to collect in regard to the exudation of the Indian tree.

"It yields a *resinous* gum" (Cat. Kew Museums). Perhaps the experiments of von Esenbeck (*infra*) are the foundation for this statement.

"It is called bastard cedar from an aromatic (*sic*) *resin* exuding from it, resembling that of the American cedar" (Art. *Cedrela Toona* in Surgeon-General Balfour's 'Cyclop. of India'). No definite authority is given for this statement, and the writer is probably laboring under a misapprehension, as the name cedar was bestowed in reference to the wood, and not to any exudation.

The experiments of Nees von Esenbeck, who *extracted from the bark a resinous* astringent matter, and a brown astringent gum, do not affect the point at issue one way or the other.

"Toon-ke-gond" (*C. Toona*) is enumerated by Dr. Wight as one of the *gums* of Coimbatore. Yet Cooke ('Gums and Resins of India'), who quotes this statement, says, "From the character of the timber one might suppose it rather a resin than a gum." I am not impressed with the force of the latter observation.

A sample of "Toon-ke-gond," the exudation of *C. Toona*, was exhibited by Dr. Royle at the exhibition of 1851 (No. 52, p. 180, Jury reports). It is not definitely stated whether it is a gum or a resin, and there is nothing in the context to clear up the point absolutely.

Dragendorff ('Pflanzenanalyse,' Greenish's Trans., p. 212) speaks of "the partially soluble *gum* of species of * * * *Cedrela*." To this specific statement of a man who only employs the term "gum" in its proper significance, I attach much importance.

I consider the balance of probability to be largely in favor of the exudation from the Indian species being a gum and not a resin. As collateral evidence, the exudations from the Indian *Melia Asadirachta*, Linn. (another of the "Chittagong woods"), and the Australian

form of *M. Azedarach*, Linn., may be instanced together with the spotted or leopard-tree gum (*Flindersia maculosa*). These are the only other exudations of the *Meliaceæ* recorded as far as I know. I have seen and examined them and they are true gums.

ASSAY OF GUM ARABIC AND GUM SENEGAL.¹

BY LIEBERMANN.

(1) Gum arabic forms round or angular, colorless, yellowish or brownish lumps, which strongly refract the light, and look as if they possessed a crystalline structure. Owing to the disturbed state of trade in the Soudan, much of the gum arabic nowadays imported is partly, or even totally, composed of gum senegal.

(2) Gum senegal forms either colorless or yellowish lumps, somewhat whitish on the surface (resembling corroded glass), the interior of which is, however, clear and lustrous. The lumps are generally longish, straight or bent, vermicular or cylindric. Sometimes they look as if small lumps have deposited round a larger one. They have to a certain extent the shape of mulberries. If, therefore, the sample is not in powder or too small lumps the very appearance will tell the fraud.

(3) Both varieties are completely soluble in water; there only remains small particles of wood, which, in samples of gum arabic, are generally reddish, but blackish in the gum senegal. These woody particles are found even in the superior kinds of the gum. Other gums, like cherry gum, are only partly soluble in water. There remains a jelly which only dissolves on prolonged boiling.

(4) The watery solution of both gums gives with potash-lye and a few drops of solution of copper sulphate bluish precipitates; but with gum arabic the precipitate is more abundant, sticks together, and rises to the surface of the fluid. The precipitates are not dissolved on heating and do not reduce the copper.

(5) Dextrin solution also gives a blue precipitate, but this dissolves completely on warming to a clear dark-blue fluid. On prolonged boiling the copper gets completely reduced.

(6) Heated for a long time with dilute potash, gum arabic or dextrin turn amber-yellow, whilst gum senegal scarcely colors at all.

¹ *Chem. Zeit.*, No. 41, 1890. Reprinted from *The Analyst*, August, 1890.

(7) Mixtures of the two gums behave towards potash and copper sulphate like pure gum senegal, but on boiling with potash alone the mixture turns amber-yellow.

(8) Mixtures of gum arabic and dextrin behave towards potash and copper sulphate like pure gum, but on long boiling reduction takes place if at least the amount of dextrin is not too small.

(9) To detect *small* quantities of dextrin the liquid must, after a slight warming, be filtered before boiling.

(10) In similar manner the separation must be performed when both kinds of gum are present, as well as dextrin. The cupric precipitate containing both gums is washed with distilled water, dissolved in a little dilute hydrochloric acid, and mixed with a large excess of spirit. After standing for a day, the transparent deposit is dried, then dissolved in hot water, and tested according to 4 and 6.

The assay of gum arabic may also be prepared according to the following scheme:

(A) The appearance of the sample when not in powder. (See 1 and 2.)

(B) Try the solubility of the powdered sample in warm water. (See 3.) If the sample is but partially soluble, and leaves a jelly-like mass, there is no doubt cherry gum. If practically soluble, the solution is mixed with excess of potash and a little copper sulphate, gently heated and filtered:

(a) The filtrate is treated for dextrin according to 9.

(b) Precipitate is treated as described in 10. The deposit will either agglomerate and float, or remain suspended in the fluid. In the first case there is gum arabic, and the original fluid will turn amber-yellow with potash. In the second case if there is no color got with potash, there is only gum senegal.

It has been said gum senegal is more hygroscopic than gum arabic. To make sure the author dried both specimens at 105° C., and then exposed them for twenty-four hours to moist air, when gum arabic was found to be even a trifle more hygroscopical than the gum senegal.

Camphoric Acid was found by Dr. Leu (*Wiener Medic. Blätter*) to give better results than atropine in cases of night-sweats due to phthisis. The average dose was 2 gm., given about noon, and 2 to 3 gm., given at night. In some cases, 4 or 5 gm. were given, usually in capsules, though the taste is not unpleasant. The after-effects are quite insignificant.

OTTO OF ROSE CULTIVATION IN TURKEY.¹

Writing from Constantinople, under date of May 21, Mr. Herm. A. Holstein says that according to the last reports from his branch house in Kissanlik, the condition of the rose fields was not exactly an unfavorable one. However, a drought had been prevailing for the last few weeks, and just before the beginning of the distillation of the roses, rain would be most desirable. Should the drought continue for a fortnight more, a heavy deficiency in the result of the crop will be experienced. Continuing, Mr. Holstein says:

An accurate estimate can only be arrived at later on. Owing to enlarged cultivation of rose bushes during the last decade, the production of otto of rose has been largely increased, but as the nature of the soil, sufficient water supply and the climatic location of the rose fields influence greatly the quality of the oil, the value of same, according to the location of the producing places, has been greatly changed. Generally the oil distilled from roses growing on the high slopes on the south side of the Balkans is more highly congealable than that of roses grown in the plains. The market price in Kissanlik as a rule is fixed on the basis of the congelation point, the higher congealable oils fetching highest prices; even too high in proportion to oils of lower degrees. By far the larger portion of the total production congeals within $13\frac{1}{2}^{\circ}$ to 15° Réaumur, while of oil congealing under 13° and above 16° Réaumur, only a limited quantity is produced. The assertion made in some quarters that an actually pure otto of rose congeals only from 14° to 16° Réaumur, and that oil congealing below 12° Réaumur must be adulterated is absolutely incorrect. If it were true, under what category would those oils that congeal from 14° down to 12° Réaumur, and which form a large proportion of the total crop, have to be placed. It is a matter of fact that some villages produce a very fine pure oil that does not congeal above 13° to $13\frac{1}{2}^{\circ}$ Réaumur, and that in other villages just as fine an oil is produced that congeals at a lower degree only. Again, it is a fact that other villages produce an oil congealing at 14 – $14\frac{1}{2}^{\circ}$ R., but in consequence of inferior perfume it is worth considerably less than oil of lower degree. There are also several villages producing oil varying greatly in regard to congelation; among others I mention Diliri

¹ From the *Oil, Paint and Drug Reporter*, July 2, 1890.

and Dabini County of Karlowa, Eoschilir County of Tcherpan, Ididjali County of Kissanlik, all distilling oils congealing within 12–15° Réaumur, so that in one and the same village producing perfectly pure oils, the point of congelation sometimes differs 3° R. The more or less care taken in the distillation and the mode of distilling are very important factors. Two different sorts of roses are cultivated for distillation of otto of rose, viz: the red rose (*Rosa damascena*) and the white rose (*Rosa alba*). The latter, however, is cultivated less than the former. The *Rosa alba* renders a very high congealable oil, but as to perfume a much inferior quality oil, and this quality is mostly bought at lower prices by those merchants and speculators who put high congelation degree above all other considerations, to make capital out of it. By the foregoing is shown that the purity of otto of rose cannot be based on the congelation degree alone, but that the fineness of the perfume is a much more important factor.

Adulteration of otto of rose at the places of production is not unusual, but is done more by merchants and speculators than by the oil-producing peasants. I don't speak of adulteration with spermaceti or alcohol, which can easily be detected. The usual adulteration, which is difficult to detect, is done with oil geranium and although the Bulgarian Government has prohibited the import of these oils, and many seizures are made on the frontier, some oil reaches its destination safely through smugglers. In selecting the different oils, long years of experience and a thorough knowledge of the article is required, and it is advisable for dealers and consumers of otto of roses to place their orders in the hands of firms who for years have gained the confidence of the trade and whose brands have a reputation in the principal markets.

The best time to purchase otto of rose is at the beginning of the campaign, about one month after the end of distillation, as at that time, better than at any other date, the finest oil can be secured; until the prices for otto of rose are established, by an understanding between the producers, about one month generally elapses. As to keeping oil of rose for a long time in copper cans I wish to say that it is not advisable to do so. The cans are tinned inside, and no matter how much care is taken in this tinning process, some small particles may come off, darken the oil, make it cloudy and spoil the fine perfume.

CALIFORNIA RAISINS.¹

There is one vast fruit industry of which California has and is likely to hold a practical monopoly. That is the production of raisins. Vineyards elsewhere may compete with those of California in wine making, but nowhere else are there combinations of soil and climate so favorable to raisin-making as here. This fact was discovered a long time ago. Dried grapes of various kinds were prepared in the old missions long before California became a part of the United States. And fully 30 years ago the manufacture of raisins, for home consumption chiefly, was systematically carried on, and on a considerable scale. But it was not until five years ago that the State began fully to realize its capabilities in that direction. In 1885, there were almost as many raisins produced as in all the 20 years preceding put together. Since then increase has been phenomenal, amounting to about 250 per cent. in four years. There has been, however, no overproduction and no reaction. A ready and profitable market has been found for all the output, and every one who has gone into the business has been more than satisfied with the results. Next year there will be a greatly increased acreage, and the output of raisins will be enormous.

The Spaniards and Indians used to dry the Mission grapes. That was about the only kind of grape grown here down to 1860, and the first experiments in genuine raisin-making were made with it. That they were not highly successful was due simply to the fact that nature did not design the Mission grape to be turned into raisins. But the men who made the experiments were not discouraged. They were convinced that California might easily be made the greatest vineyard in the world. But to accomplish that end it would be necessary to introduce some other varieties of grapes. So they sent to Europe and brought over shiploads of cuttings from the vineyards of France, Spain, Italy, Germany and Hungary. These were scattered all over the State, and from them have sprung the vast vineyards of the present day. The chief object aimed at then was the production of wine, and the cuttings were selected accordingly. But among the varieties imported were three of the best raisin grapes in the world—the *Feher Zagos*, the *Muscatel* and the

¹ From a correspondence dated Los Angeles, July 28, 1890, published in *The New York Tribune*.

Muscat of Alexandria. From these, and especially from the second, much wine is made. But they supply also the raw material for the millions of boxes of raisins that are each year shipped from California to the markets of the world.

Where, when and by whom raisins were first successfully made for market is not well established, but it was probably in 1863, and the grapes used were *Feher Zagos* and *Muscat*. For some years thereafter, however, little interest was taken in the subject. A few raisins were made, experimentally, out of curiosity, or to supply a small local demand. That was all. Not until 1873 was the work taken up in thorough earnest. But in that year it was entered into extensively in several parts of the State at the same time and the result was the production of 6,000 boxes, or 120,000 pounds, of pretty good raisins. There was much to discourage the growers, however. They were trying to make raisins according to the methods practised in Spain and elsewhere in the Old World. But these methods would not work well here. Nor, indeed, were American manufacturers willing to follow out the full formula of Spain, which involved some utterly disgusting details. And as yet they had discovered no new system of their own. For several years there was much work and no profit. Sometimes a man would turn out as good raisins as ever were seen. Then he would make a lot that were too moist, and they would mould and rot; while a third attempt would result in dry, shrivelled things that rattled about in the boxes like so many hickory nuts. Many men grew quite discouraged, and either rooted up their vineyards altogether or took to making wine. But there were some who stubbornly persevered in trying to make raisins.

Their labors were at last rewarded by the discovery that the best formula was no formula at all. That is, that raisins were to be made best by the simplest possible process, without any dipping into strange mixtures, or spreading on gravel beds, or any such work. The fruit must be just at the proper point of ripeness, and the less it is handled the better. The bunches are laid on wooden trays, about 20 pounds to the tray, and thus exposed to the sunlight and sun heat for several days. Six to eight days generally suffice, but considerable skill is required to determine when exactly the proper stage of drying has been reached. Then they go into what are called the sweat-boxes for a week or so, where the moisture that

remains in them is equally distributed throughout the whole berry. Then they are sorted and packed, the whole bunches being packed in that form, while the broken clusters have all the stems removed and are packed as stemless raisins. The stemming is done by machinery, but the packing is done by hand, women and girls being employed for the purpose.

The three grapes mentioned form the mainstay of the raisin industry. In some places the seedless Sultana does well, and it is believed by many that it will soon become the favorite raisin grape. In the southern part of the State the Malaga grape succeeds better than any other, but at the present time the Muscat is grown probably more than all others put together. It has a rich and spicy flavor that no other raisin grape possesses, and on this account Muscat raisins are most in demand. It grows well in almost any soil, and is the most steady and trustworthy of all in its bearing. The vines are usually planted five feet apart, in rows 14 feet apart. Artificial irrigation has, of course, to be employed. The returns from a vineyard come very quickly. The second year a fair crop may be gathered from rooted vines, and the third year from cuttings. A year or two later the vineyard is in full bearing. There are cases on record of more than \$50 worth of grapes being taken from an acre of vines that had been in the ground only a year and a half. Good raisin land can be purchased in the various localities adapted to the industry at from \$50 to \$200 per acre. The location governs the price, and the \$50 land will be just as good as the \$200, except that it will be more remote from shipping facilities. It is calculated, from the experience of hundreds of growers, that an expenditure of \$60 an acre will cover the entire cost of planting and cultivating for three years. If the raisin grower does his work himself this expense will be reduced solely to the outlay required for the vines and possibly a little help in planting.

In the early days of raisin production it was customary for the growers to pack their own fruit and market it themselves. There was a great deal of loss from this system, caused by the irregularity of grading and the difficulty of finding a market for the fugitive shipments thus made. Subsequently there grew up a system of wholesale packing, by which firms established themselves in the raisin districts, put up large warehouses and then contracted for the fruit in the sweat-boxes. The producer received cash on delivery,

while the packer assorted and graded all the fruit received, and so was able to establish uniform brands. The price for the raisins in the sweat-box has varied considerably. It has been as low as four cents a pound, but with the increase in production and the widening of the market there has been a steady stiffening in prices, and last year from five to six cents was paid.

The greatest raisin county in the State is Fresno, where the soil is peculiarly adapted to grape culture. That county last year produced about 625,000 boxes of raisins of the best quality. Riverside came next, with 225,000 boxes. Twenty years ago there were less than 1,500 grape vines in all San Diego County. Now there are 3,000,000. Yolo was the scene of some of the earliest raisin making, and its output last year was 130,000 boxes. The most carefully prepared statistics show the entire raisin product of the State to have been in various years as follows: 1875, 222,000 pounds; 1880, 1,500,000 pounds; 1885, 9,500,000 pounds; and in 1889, 32,678,000 pounds. What the yield of the present year will be cannot be estimated as yet with any accuracy, but it will probably reach 45,000,000 pounds, for the increase in acreage is very great. Last year there were less than 60,000 acres of vines in bearing, but planting was carried on extensively. Perhaps 10,000 acres of new vineyards are in bearing this year, and next year nearly 95,000 acres will be in full bearing. This should swell the output of raisins in 1891 to at least 55,000,000 pounds.

LIQUID KINO.¹

By J. H. MAIDEN, F.L.S., F.C.S., Curator of the Technological Museum, Sydney.

Angophora intermedia (D.C.), the narrow-leaved apple tree, is a tallish tree, which extends from Victoria to Queensland, and is the only species of the genus which is found in the southern colony. In the following respect it is perhaps unique amongst Australian trees. Frequently, when an incision is made into the bark, and more particularly when the knobby excrescences sometimes found on this tree are cut, there exudes a watery liquid, which occasionally is almost as clear and as colorless as water, and at other times

¹ Read before the Royal Society of Victoria, July 11, 1889. Communicated by Baron Ferdinand von Mueller, K.C.M.G., F.R.S., etc. Reprinted from *Phar. Jour. and Trans.*, July 12.

of an orange-brown or reddish-brown color, and of the consistency of a thin extract, or even as thick as treacle. This is doubtless the substance which was sent from New South Wales to the Paris Exhibition of 1867, labelled "apple-tree juice," with the statement that it is used as a varnish; but this is not correct, as the liquid is aqueous. It is used by fishermen for tanning their nets. Mr. Kirton informed Baron von Mueller that a single tree will yield as much as 2 gallons of liquid, which is generally called "liquid kino." This is a modest computation, for the tree which yielded the Bangley Creek sample (*infra*) yielded from 8 to 10 gallons. The quantity is, in any case, by no means small, and is dependent on a variety of circumstances.

Two samples of this "liquid kino" having recently been forwarded to the Technological Museum, the author has had an opportunity of examining it.

(1) From Bangley Creek, Cambewarra, N.S.W., of a clear reddish-brown color, and in order to give precision to the tint, it is very like raw linseed oil, Strassburg turpentine, or dark balsam of copaiba, but redder than any of them. It has a specific gravity of 1.008 at 60° F., and an acidulous smell (owing to the presence of acetic acid), accompanied by an odor not so pleasant and reminding one somewhat of spent tan liquors. It deposits a quantity of sediment of a buff color, consisting almost entirely of catechin. It contains tannic acid .772 per cent., "non-tannin" .508 per cent. (Löwenthal's process). The water amounts to no less than 98.3 per cent. The catechin was not estimated in this sample.

(2) This was obtained from Cambewarra, but from a different locality. It is darker in color than the preceding sample, being of a richer ruby color. Like No. 1, it deposits a small quantity of sediment (catechin). This liquid kino had a specific gravity of 1.022 at 60° F., when received in April, 1888.

The following results were obtained in December to January, 1889:—Tannic acid 3.048 per cent. (of the liquid kino, without evaporating), "non-tannin" 1.27 per cent. (a portion of liquid kino, kept in agitation so as to obtain a fair proportion of sediments, was added to water to make up the strength of one grain of liquid kino to the litre), water 96.7 per cent. (after filtration from deposited catechin). The catechin and a little phlobaphene filtered off, were found to be in the proportion of .495 per cent. of the original liquid

kino. Ether agitated with the filtrate took up 15 per cent. of which one-third was estimated to be catechin, and the rest resin.

Mr. Kirton has recorded liquid kino from the Illawarra district of New South Wales, but since there appears to be no reason why it should be found in one colony more than another, it will doubtless also be obtainable in Victoria, most likely on application to fishermen.

ON BOILED LINSEED OIL.

BY FRANK H. THORP, S.B.

The author has published in the *Scientific American* the details of a large number of experiments on the preparation of boiled linseed oil with the agency of the oxides and various salts of lead, zinc and manganese, and his results are summarized in the following:

CONCLUSIONS.

Lead driers always give the oil a deep color, which shows more or less in the film.

Zinc driers do not appear to act on the oil to any great degree, as oils thus prepared dry slowly and do not give very hard films.

Manganese driers give the best results in all respects. Litharge gives the best results of the lead driers, the oil being quick drying and the film hard, and, if not overheated, the oil is but moderately colored. Of the zinc salts, the acetate seemed to give the best results, although the borate and citrate were nearly as good. The borate and acetate of manganese gave the best results obtained. The acetate requires careful use, for, if heated much above 230°, it gives a deep color to the oil, owing apparently to the formation of tar. The borate undoubtedly gives the best boiled oil for all purposes.

The oxalate is difficult to decompose, or at least has little or no action on the oil until a very high temperature is reached. In two experiments the quantities of borate and oxalate used and the temperature of each were nearly the same, but the borate gave a good oil, while the oxalate did not.

The chloride, nitrates and sulphates do not make good driers. The first two have too violent an action on the oil, while the last are very difficult to decompose, requiring a high temperature.

There appears to be no advantage in the use of formates, citrates,

or tartrates. The first two are apt to produce much tar, and the last are difficult to decompose.

No very definite conclusions can be drawn as to the relation between the quantity of drier dissolved and the rate of drying of the oil. From the few analyses made there would appear to be some relation here: but in two cases, lead borate and manganese tartrate, exceptions were found. The lead borate gave an oil drying much more slowly than was to be expected, while the manganese tartrate oil dried with comparative rapidity. The quantity of manganese dissolved appears to be much less than the quantity of lead taken from lead dryers. Two-tenths of one per cent. of manganese appears to give a good drying while about one per cent. of lead occurs in the best drying oils.

THE MEDICINAL USES OF LEAVES.

By P. L. SIMMONDS, F.L.S.

In continuation of the previous article on the reputed medicinal uses of leaves, published in the April number, pages 193 to 197, I now append a supplementary list:

The leaves of *Abrus precatorius*, when mixed with honey, are applied to swellings, and in Jamaica are used as a tea substitute. In Africa they are chewed by singers to moisten the throat. A curious use is also made of them as a sort of love philter, recognized by fetiches. They are given by suitors or lovers, steeped in spirit, to a father, to induce him to give his daughter in marriage.

The dried leaves of *Adhatoda vasica*, made into cigarettes, are smoked in cases of asthma, and produce very beneficial effects.

The dried leaves of *Abies Webbiana*, known as Talispatra in India, are regarded as carminative, expectorant, stomachic, tonic and astringent; useful in phthisis, asthma, bronchitis and catarrh of the bladder. The dried leaves of various plants also receive the name of talispatra, provided they are found useful in the treatment of coughs (Watts).

An essential oil is obtained from the leaves of *Acorus Calamus*, which is used in England by perfumers in the manufacture of hair powder. Formerly the leaves of the sweet flag were spread over the floors of churches and cathedrals (especially in Norfolk) upon great occasions, the pressure of the foot causing a pleasant odor.

The leaves of *Achyranthes aspera*, reduced to a pulp, are considered a good remedy, when applied externally to the bites of scorpions.

The leaves of *Egle Marmelos* are made into poultices and used in the treatment of ophthalmia. A decoction of the leaves is used as a febrifuge and expectorant.

The leaves of *Albizzia Lebbek* are regarded as useful in ophthalmia. Those of *A. odoratissima*, boiled in ghee (or fluid butter), are used by the Santals as a remedy for coughs.

The leaves of *Allamanda cathartica* are considered a valuable cathartic in moderate doses.

The acrid leaves of some aromatic species of *Ammania* are universally used in India to raise blisters in rheumatic pains, fevers, etc., which they do in half an hour.

The leaves of *Asarum europæum* have been strongly recommended in headache, chronic ophthalmia, rheumatic and paralytic affections of the face, mouth and throat, and are in great repute in Russia as a remedy for deranged state of health, consequent on habits of intoxication.

The juice of the leaves of *Ballota lanata* is applied to children's gums, and in ophthalmia in man and beast.

Buchu leaves (*Barosma spec.*, see p. 194), when used in the form of infusion, promote perspiration. Hence their utility in chronic rheumatism, gout and other diseases, caused by the sudden suppression of cutaneous action. They have been prescribed also in cholera morbus, and are very beneficial in diseases of the bladder. They have also been given in dropsy. As a stimulant to the stomach some practitioners have used the buchu leaves in indigestion. A bath of the buchu leaves is of service in rheumatism, and the buchu vinegar and buchu brandy are excellent embrocations in rheumatic pains, sprains and contusions.

The natives of India apply the juice of the leaves of *Barleria prionitis* to their feet in the rainy season to harden them, and thus prevent the laceration and cracking of the soles which would otherwise occur.

In India an extract or juice obtained from the leaves of *Barringtonia acutangula*, mixed with oil, is used in native practice for eruptions of the skin.

The astringent leaves of *Brasenia pellata* have been employed in phthisis and dysentery in North America.

The leaves of *Cardiospermum Halicacabum* are used in amenorrhœa and administered in pulmonic complaints. A paste made with the leaves, rubbed up with castor, is applied in rheumatism, and to reduce swellings and tumors of various kinds.

The young tender leaves of *Casalpinia Bonducella* are considered very efficacious in disorders of the liver, and are used in intermittent fevers and for expelling intestinal worms.

The fresh juice of the leaves of *Clerodendron infortunatum* is employed by the natives of India as a vermifuge and also as a bitter tonic and febrifuge in malarious fevers, especially in those of children.

The leaves of *Cassytha filiformis* are used as an aperient, and a decoction constitutes a valuable wash in skin diseases.

The leaves of *Cerbera Odollam* are used in Java as a substitute for senna, but their use is dangerous.

Chenopodium ambrosioides has a strong aromatic smell from the ethereal oil it contains. Its properties are antispasmodic, diaphoretic and anthelmintic, and the best form for its administration is that of tea or infusion.

The leaves of *Cymbonotus Lawsonianus* are made into a salve with melted lard in New South Wales, which is much appreciated for its healing qualities for wounds, etc.

The leaves of *Duboisia Hopwoodii* (Mueller), known as *Pituri*, form the masticatory of the aborigines of Central Australia, corresponding in this

respect to the coca of Peru, the betel nut of Asia and the kaat (*Catha edulis*) of Arabia.

The leaves of *Eucalyptus globulus* and other species possess febrifugal properties to some extent, and extracts and liquors are sold as fever and ague remedies and as a general tonic. An extract of Eucalyptus leaves is said to remove scale from boilers. *E. maculata* has a delightful odor of citron, and is used to perfume and protect clothes. The leaves of *E. Staigeriana*, of Queensland, possess an odor very like the scented verbenas, *Lippia citriodora*. The yield of oil obtained from them is from $2\frac{3}{4}$ to 3 per cent.

The leaves and flowers of *Galium africanum* are said to be a cure for diarrhœa.

The fragrant leaves of *Panax Lessonii* bruised and mixed with grease form a favorite native perfume in New Zealand.

The sap of the crushed leaves of *Hydrocotyle asiatica* is used with alum in the Cape Colony for sore mouths. It is recommended in India as a remedy for leprosy.

The leaves of *Helichrysum pedunculare* are used as a healing plaster on the white side, and as a drawing plaster on the green side.

The boiled leaves of *Ipomœa Pes-capræ* are used internally as an anodyne in cases of colic, and in decoction in rheumatism.

An infusion of the leaves *Lantana salviaeflora* is said to cure infectious ophthalmia, but it produces burning pain and is, therefore, somewhat dangerous.

The wild hemp, *Leonotis Leonurus*, is employed in the form of a decoction in chronic cutaneous eruptions, and may be tried even in cases of leprosy. The usual dose is a wineglass full three or four times a day. The Hottentots are particularly fond of this plant, smoke it instead of tobacco, and take a decoction of its leaves as a strong purgative.

The leaves of *Melaleuca uncinata*, if chewed, are very useful in alleviating and curing ordinary catarrh.

The leaves of *Melastoma malabathricum* are used in India in cases of diarrhœa and dysentery.

The expressed juice of the succulent leaves of *Mesembryanthemum edule*, taken internally, checks dysentery, and acts as a mild diuretic; while it is also, for its antiseptic property, used as an excellent gargle in malignant sore throat, violent salivation and aphthæ, or in the form of a lotion in burns and scalds.

In the Cape Colony the dry leaves of *Mohria thurifraga* are pulverized and with fat made into an ointment, which is cooling and very serviceable in burns and scalds.

In India the leaves of *Morinda citrifolia* are used as a healing application to wounds and ulcers, and are administered internally, as a tonic and febrifuge.

A decoction of the leaves of *Melianthus major* has been found an excellent remedy in the Cape Colony for *tinea capitis*, and when applied to foul ulcers promotes granulation.

The oil of the leaves of *Pagetia medicinalis* is said to be of medicinal value.

The leaves of *Polanisia viscosa*, boiled in ghee, are in India applied to recent wounds, and the juice to ulcers.

A poultice of the leaves of *Pongamia glabra* is also a popular application in India to foul ulcers.

The leaves of *Pelargonium ramosissimum* are used in amenorrhœa and dysmenorrhœa.

The leaves and flowers of *Pteronia spec.* are used in the Cape Colony as a febrifuge and also as a purgative.

The juice of the leaves and stems of *Ranunculus pinnatus* is used by the Kaffirs for wounds and sores of all kinds.

The leaves of *Anchusa riparia* (?) pounded are also used as a salve for sores and wounds.

The leaves of *Solanum niveum* are smooth on the upper and woolly on the lower surface. The application of the latter to foul ulcers cleanses them, and a cure is afterwards effected by applying the upper surface.

Like those of the common sage the leaves of the Hottentot sage (*Salvia africana*), are fragrant, astringent and bitter. They possess nearly the same medical properties as the European sage, and are used in the same way, and under similar circumstances.

Teucrium africanum is the chief plant relied on by the Kaffirs as an antidote to snake bites. An infusion of the leaves is employed, if they can be had fresh, otherwise a tincture.

PHARMACEUTICAL ASSOCIATIONS.

The Arkansas Association of Pharmacists met at its eighth annual meeting at Pine Bluff, June 24. An address of welcome by Gen. H. K. White, the annual address by President Kerr, reports by the Secretary, Treasurer and several committees, and the consideration of a revision of the by-laws occupied most of the time of the Association. A paper on *Chinese Medicine and Pharmacy* was read by E. T. Mitchell. The executive officers of the present year are W. W. Kerr, Batesville, President; J. W. Beidelman, Little Rock, Secretary, and D. W. Holman, Little Rock, Treasurer.

The Illinois Pharmaceutical Association convened its eleventh annual meeting at Kankakee, August 12, President H. Schroeder in the Chair, who in his annual address made a number of suggestions looking towards greater efficiency in the work done by the Association. The Treasurer reported a balance of \$314 on hand. Reports were received from the Secretary and the several standing and special committees, and were duly acted on. An invitation for the appointment of delegates to a convention of Western pharmacists, was complied with, and ten delegates were ordered to be appointed. The meeting is to be held next year at Excelsior Springs, Mo., and is intended for the consideration of pharmaceutical interests, and to accomplish, if possible, uniformity of the pharmacy laws in the states contiguous to the lower Missouri River.

A paper on *50 per cent. Tinctures*, by A. A. Culver, elicited much discussion leading to the adoption of a recommendation, that such tinctures be introduced into the Pharmacopœia in all cases where new liquid preparations of drugs are required.

Papers were also read on *Synthetic Phenol*, by C. L. Feldkamp; on *Pepsin*, by Prof. Oldberg; on the *Use of the Microscope in Pharmacy*, by A. E. Hiss, on *Stock and Fixtures*, by C. S. Hallberg, etc.

On motion of Mr. Hallberg the International Pharmaceutical Congress was invited to hold the next meeting in Chicago in 1893.

The proceedings for the year 1889 were directed to be published with those of 1890 in conjunction with the report of the State Pharmacy Board.

Riverview, Kankakee, was selected as the place for holding the next annual meeting, on the second Tuesday of August, 1891. The executive officers for the current year are: A. A. Culver, Momence, President; C. S. Hallberg, Chicago, Secretary, and A. L. Moody, Lockport, Treasurer.

The Maine Pharmaceutical Association has been dormant for a number of years, but through the efforts of the Kennebec Valley Druggists' Association an effort at reorganization has been made last July on Long Island, near Portland, when Charles K. Partridge, Augusta, was elected President; H. E. Bowditch, Augusta, Secretary; F. R. Buck, Skowhegan, Treasurer, and H. T. Cummings, Portland, Corresponding Secretary.

The Wisconsin Pharmaceutical Association held its eleventh annual meeting at Appleton, August 12, President Edwards in the Chair. The President's address and the reports of the Secretary, Treasurer, committees and of the Pharmacy Board were received and disposed of. Among the papers read was one on *Commercial Seidlitz Powders*, by A. Conrath; on *Pill Excipients*, by F. M. Crow; on *Pharmacopœial Syrups*, by A. Conrath; on the *Apothecary Weights of Commerce*, by F. Esau, etc. A paper by J. A. Dadd, on *Sunday Closing*, gave rise to much discussion, which resulted in the adoption of a resolution favoring the partial closing of pharmacies on Sundays.

Dr. F. Hoffmann, of New York, was elected honorary member, and the following officers were chosen for the current year: R. Sauerhering, Mayville, President; E. B. Heimstreet, Janesville, Secretary, and W. P. Clarke, Milton, Treasurer. The next meeting will be held in Milwaukee, August 11, 1891. John Kienth is the Local Secretary.

The following printed proceedings of State Pharmaceutical Associations have been received:

Missouri.—Twelfth Annual Meeting. Pp. 174. See July number, p. 374. The following papers, not previously noted, were read: *Liquor Ferri Chloridi*, by F. Hemm; *Resina Podophylli*, by G. H. C. Klie; *Tablet Triturates*, by the same author; *Lycopodium*, by Dr. H. M. Whelpley; *Objections to Pepsin in Liquid Form*, by D. L. Haigh, etc.

Nebraska.—Ninth Annual Meeting. Pp. 93. See July number, p. 375.

Pennsylvania.—Thirteenth annual meeting. Pp. 140. See July number, p. 376.

Texas.—Eleventh Annual Meeting. Pp. 89. See July number, p. 376.

EDITORIALS.

The Registration of Physicians as Pharmacists in Pennsylvania has been before the Court of Quarter Sessions of Dauphin County during the past June term. Dr. W. H. Prowell, carrying on the drug business without being registered, was prosecuted by the Pharmaceutical Examining Board and was found guilty upon the facts being submitted to the jury in writing as a case stated. Upon a motion being made for a new trial, the Judge in granting the motion delivered an opinion from which we make the following quotations:

"The grammatical form of the expression (Section 11 of the Pharmacy Act) 'may be registered' and 'be granted a certificate' is passive, and therefore in

strictness would *not* imply an option on the part of the person who was the subject of the action."

Then, quoting Section 3, the Judge continued: "The power to register is given to the board, and it is certainly grammatically incorrect to say that it is the duty of the persons who apply 'to be registered.' But such use of language shows that the person who drafted the act was not accustomed to accuracy of logical or grammatical expression, and therefore, that it would *not* be safe to attempt to construe the act by the aid of grammatical rules. When it is said that it 'shall be the duty' of certain persons 'to apply to said board and be registered,' the meaning is that it shall be their duty to apply, and, on application, their right to be registered; and so we think that when it is said in sec. 11, that the persons therein designated 'may be registered under this act without examination and be granted a certificate,' the meaning is that, upon application, they shall have the right to be registered without examination. Apart from the language of the act, it would *seem* reasonable that a 'graduate of an accredited medical college, who has had not less than three years' continuous practice since the date of his diploma, and who is registered as a practitioner of medicine and surgery, *ought to be entitled to be registered without examination.* Sec. 6 and the last clause of sec. 10 of the Act expressly reserve the right to physicians to compound their own medicines, drugs and poisons; but a person who is presumed to be qualified to prescribe as well as compound drugs and poisons to his patients, it would *seem* ought to be considered to be qualified to compound the same when prescribed by others. For these reasons and others which might be given, we think the conviction is wrong, and that the judgment must be arrested and a new trial granted, and it is therefore so ordered."

We do not intend to minutely analyze the statements and deductions of this judicial opinion, but mainly direct attention to some parts which we have italicized. The first sentence quoted acknowledges the right of the Pharmacy Board to refuse registration to such applicants. But in the Judge's opinion, section 11 means directly the opposite, because another section (3) is not rendered as grammatically unobjectionable, as might have been done. The preamble of the law states that its object is to secure the *proper qualification* of those keeping a retail drug store; the assumption by the Judge of proper qualification in the case under consideration is entirely extra-judicial, and is not based either upon facts presented, nor upon testimony heard, nor upon his Honor's knowledge of medicine or of the drug business.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Mittheilungen aus dem pharmaceutischen Institute und Laboratorium für angewandte Chemie der Universität Erlangen. Von A. Hilger. München, 1890. M. Rieger. III Heft. 8vo. pp. 184.

Contributions from the Pharmaceutical Institute and Laboratory for Applied Chemistry of the University Erlangen.

This pamphlet contains the following essays, based upon researches carried on in the Institute named: Chemical and Microscopical Examination of Coffee and its Substitutes, by C. Kornauth; Estimation of Tartar, Tartaric Acid and

Malic Acid in Wine, with Critical Studies on the Organic Salts of Wine, by Max Schneider; Specific Gravity of Milk Serum and its Importance for the Detection of Milk Adulteration, by P. Radulescu; Critical Studies on the Estimation of Coffeine in Tea, by F. Vité; the Drinking Water of the City of Erlangen, by J. Crone. The first essay named is illustrated by thirteen photolithographic plates of the microscopic appearance of the tissues and powders of twenty articles used as substitutes for coffee.

Untersuchung von Nahrungs- und Genussmitteln, etc.

A reprint from the transactions of the Dorpat Naturalists' Society, giving a brief account of the examinations of articles of food, drink and domestic use, which have been carried on during the past two years under the supervision of Professor Dragendorff.

Artificial Anæsthesia.—A manual of anæsthetic agents and their employment in the treatment of disease. By Laurence Turnbull, M.D., Ph.G., etc. Third edition, revised and enlarged. Philadelphia: P. Blakiston, Son & Co. 1890. pp. 531. Price \$2.50.

The importance which anæsthesia has assumed of recent years is readily observed in the increase of size of the present edition as compared with the preceding one, it being over 200 pages. This increase is due on the one hand to the careful revision of the subject matter contained in the preceding edition, necessitating the re-writing of much of the text, and incorporating the recent observations and conclusions in regard to the older anæsthetics; but it should be remembered that since the introduction of cocaine as a local anæsthetic a very large number of drugs and chemical compounds have been observed to possess more or less of anæsthetic action, and to be adapted for such purpose in special cases. On looking over the long list of these agents, which are treated of in the volume before us, quite a number will be found to be derived from plants which have been employed medicinally for a long time, and it is to be expected that many others will be discovered in the future, either as natural products, or as synthetically prepared compounds. In all its details the work shows the intimate familiarity of the author with its subject, and the watchful care in sifting the facts. While primarily intended for the surgeon and physician who use anæsthetics, the pharmacist will likewise find in it much of especial usefulness. The forty cuts are mostly in illustration of apparatus. Paper and typography leave nothing to be desired.

Report of Willis G. Tucker, M.D., Ph.D., analyst of drugs. Extract from the tenth annual report of the New York State Board of Health.

The samples examined numbered 532, of which 233 were of good, and 54 of fair quality; 24 were of excessive strength, 130 inferior, 58 fictitious, and 33 were not as called for. Of 115 samples of *cream of tartar* collected from grocery stores, 30 only were of good quality, while 25 were more or less adulterated in some cases to the amount of 80 per cent; 58 were entirely fictitious, and two consisted of poor baking powder. Of 49 samples of *compound spirit of ether* eight only were of good or fair quality, the balance consisting mostly of the final distillate in the manufacture of ether. Safflower was furnished 17 times, and crocus martis once, when *saffron* was called for, three samples being true saffron. The 31 samples of *precipitated sulphur* consisted in 16 cases of lac sulphur with a large proportion of calcium sulphate; in 6 cases of washed sulphur;

one sample was strongly acid, and eight were of good or fair quality. The various diluted acids were not unfrequently found to be deficient in strength, or occasionally considerably stronger than they should have been. Twenty-one out of 68 samples of *stronger ether* had an excessive specific gravity. The remaining chemicals and drugs were of good quality, with but few exceptions.

The Preferable Climate for Consumption, or the comparative importance of different climatic attributes in the arrest of chronic pulmonary disease. By Chas. Denison, A.M., M.D., etc.

The author, who is professor of diseases of the chest and of climatology in the Medical Department of the University of Denver, treats of a subject of great importance in the treatment of the disease mentioned. His essay was presented to the Ninth International Medical Congress, and is now republished by order of the Legislature of Colorado.

The reception of the following pamphlets is herewith acknowledged:

The Valedictory Address.—By B. Ogle Tayloe, Phar.D., of the National College of Pharmacy, Washington, D. C.

Analysis of Chocolate and Cocoa.—By Geo. F. Weida, assistant in the University of Kansas.

A History of Spectacles.—By L. Webster Fox, M.D., ophthalmic surgeon to the Germantown Hospital, Philadelphia.

Electrolysis in the Treatment of Stricture of the Rectum.—By Rob. Newman, M.D., consulting surgeon Hackensack Hospital.

A Rational Brace for the Treatment of Caries of the Vertebrae.—(Potts' disease.)

A Practical Splint for Inflammatory Conditions of Joints.

The Treatment of Torticollis.—(Wry-Neck.)

The last three essays are by Dr. Chas. F. Stillman, of Chicago.

A Compend of Chemistry, inorganic and organic; including Urinary Analysis. By Henry Leffmann, M.D., etc. Third edition, revised. Philadelphia: P. Blackiston, Son & Co. 1890. 16mo, pp. 193. Price, cloth, \$1; interleaved, 25 cents.

This little book is intended for the student, to save him the trouble of taking copious notes during the lectures, and to aid him in reviewing the subject matter systematically. It outlines the science of chemistry with special reference to the wants of the medical student, thus saving to the latter the time and labor of preparing excerpts—or at least many such—from the larger text-books. Its contents are divided into chapters on general principles, inorganic chemistry, organic chemistry, biological chemistry, urinary analysis and antidotes. That the author, who holds the Chair of Chemistry in several colleges, understands the needs of the students, is shown by the entire make-up of this book, its scope and the clearness and accuracy of its statements; also by its freedom from stereotypic queries and answers, notwithstanding the book is designated as a "quiz-compend." If we were to suggest what in our opinion, would be an improvement, we would recommend that greater prominence be given to those reactions between medicinal agents which result in insoluble, or otherwise strikingly different compounds, causing those agents to be considered "incompatible."

Recovery of absorbed Morphine from the urine, the blood and the tissues. By T. G. Wormley, M.D., etc. Pp. 11.

A reprint from the May number of the *University Medical Magazine*, giving the results of observations on an important subject, which have been made with Professor Wormley's accustomed circumspection.

Upon a Collection of Plants made by Mr. G. C. Nealley, in the region of the Rio Grande in Texas, from Brazos Santiago to El Paso County. By J. M. Coulter. Pp. 37.

This is the second pamphlet issued as "Contributions from the United States National Herbarium." It gives the names, localities of collection and other observations on 903 species of plants collected as stated above.

Identité de la Dengue et de la Grippe-Influenza.—Par le docteur Jules Rouvier, Professeur de clinique obstétricale et gynécologique de Beyrouth. 8vo. Pp. 48. Price, 1 franc.

Identity of dengue with grippe-influenza.

OBITUARY.

Alexander Von Bunge, the nestor of botanist, died in Dorpat, aged 87 years. He was of German descent, born at Kiew in 1803, studied at Dorpat medicine and natural sciences, and took the degree of M.D. in 1825. Accompanying his tutor, Ledebour, the celebrated botanist, in 1826, to Siberia and the Altai Mountains, he subsequently was engaged in botanical explorations in China, the steppes of the Volga, and other parts of the Russian Empire and of Asia. In 1834 he became professor of botany in the University of Kazan, and from 1836 he occupied the same chair in Dorpat, until in 1867 he resigned, afterward devoting his time altogether to scientific researches. His contributions to botany embrace the floras of different sections of Russia, the Altai Mountains, parts of China, Mongolia, etc.

Samuel S. Bunting, Ph.M., a graduate of the Philadelphia College of Pharmacy of 1850, and for many years one of the Trustees, also Treasurer of the College, died at his residence, Greenbank, near Secane, Pa., August 15, 1890. A more extended notice of his life and faithful services to the college will be prepared by the proper committee.

John Franklin Hildebrand, Ph.G., class 1887, died of typhoid fever, eighteen months after graduation, at York, Pa., aged 24 years.

Frank P. Lins, Ph.G., class 1877, died in Philadelphia, May 17th last, of consumption, aged 40 years. He had been in business in this city, but owing to declining health he went to Colorado about two years ago. His death was hastened by an attack of the grippe in January last.

Samuel Robert Means, Ph.G., M.D., died at St. Elizabeth Asylum, Washington, D. C., August 1, in his twenty-seventh year. He was born in Ferguson Valley, Mifflin County, Pa., received his education in the public schools and at the Lewistown Academy, and after graduating from the Commercial College in Philadelphia, entered the drug store of D. L. Stackhouse and graduated from the Philadelphia College of Pharmacy in 1886. In 1889 he received his medical degree from the National Medical College of the Colum-

bian University in Washington, standing first in his class and receiving the highest prize of the college. He next accepted a responsible position in the Children's Hospital, which he filled with credit to himself and to the institution. In June, 1889, he was called to the more responsible post as physician to the Government Hospital for the Insane, St. Elizabeth, where he remained faithful to his charge until after an illness of 18 days his promising career was terminated.

John B. Metzger, Ph.G., class 1881, died at Williamsport, March 16, 1890, of gastric catarrh, aged 43 years. His graduating thesis was on elderberries; an abstract of it was published in this journal in 1881, p. 553.

Chas. Fred. Wm. Pleibel, Jr., Ph.G., class 1879, died suddenly in Philadelphia, August 12, 1890. He had learned the business with his father, Dr. F. Pleibel.

VARIETIES.

Bad Effects of the New Antipyretic.—Excluding the effect of heroic doses and considering only those which are ordinarily regarded as medicinal, Dr. Goldmann is led to the following conclusions:

Antifebrin.—Individual susceptibility to this drug differs widely. Even the smallest doses are capable of giving rise to dangerous symptoms. Especial caution is necessary in using it among children. Its continued administration begets a cumulative action. Collapse, cyanosis, vomiting, and profuse sweating not infrequently result.

Antipyrin.—Neither may any absolute dose be stated of this substance. It also needs to be used with prudence among children. It also possesses a cumulative power. Exanthems, collapse, cyanosis, dyspnoea, vomiting, and excessive perspiration are often its effects. That death sometimes follows the exhibition of comparatively small quantities admonishes us to prudence.

Phenacetin.—Eruptions and copious sweats are not infrequently occasioned the latter especially in persons predisposed to free perspiration. Cyanosis and collapse are of less common occurrence. It should be given cautiously to children.

Without expecting it to take the place entirely of the other two bodies, phenacetin may well be preferred to them in many cases, especially in regard to the fact that it is less liable to create embarrassing and dangerous manifestations.—*Med. Bulletin.*

Ammonium Bromide Inhalations are recommended in asthma by Dr. Th. Maxwell (*Lancet*, May 10). Strong hydrobromic acid, spec. grav. 1.7, may be used together with ammonia water. But since it is difficult to thus obtain absolutely neutral fumes with the ordinary inhalers, an apparatus was constructed in which the ammonium bromide is simply vaporized by heat and drawn through a wash bottle before being inhaled.

The antiseptic action of iodoform appears to be very feeble. According to the observations of many investigators, it does not prevent the growth of micro-organisms, although it may, perhaps, be decomposed by the secretions of wounds so as to set free the iodine, and thus exert an antiseptic action.—*Jour. Amer. Med. Assoc.*, May 10, p. 686.